

**BEFORE THE CANTERBURY REGIONAL COUNCIL**

**IN THE MATTER OF**

The Resource Management Act 1991

**AND**

**IN THE MATTER OF**

applications by **Glenmore Station Limited** to  
undertake works in the bed and banks of the  
Cass River (**CRC073109**); in order to  
maintain a diversion of water into an existing  
water race (**CRC052501**); then  
take and use the water to irrigate 180 ha of  
pasture and forage crops at Glenmore Station,  
Godley Peaks Road, Lake Tekapo (**CRC052502**);  
and  
to discharge emergency overflow to Mailbox  
Swamp Creek (**CRC052503**).

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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 applications CRC052501, CRC052502, CRC052503 and CRC073109 by **Glenmore Station Limited** (the applicant). This decision follows and should be read in combination with our Interim Decision on these applications dated 23 March 2012.

## **2 INTERIM DECISION**

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- 2.1 In our Interim Decision, we concluded that further information was required from the applicant to enable the decision to be finalised and consent issued with conditions. In particular, we directed that the applicant provide the following information:
- (a) The applicant's view on the location of a suitable 'downstream' monitoring site, including evidence of discussion with ECan officers on the effectiveness of the site selected;
  - (b) The map reference of the preferred monitoring site; and
  - (c) The parameters and methodology to be included in the monitoring condition noting that different parameters and methodology depending on whether it is Pierce Pond, an alternative stream site, or Lake Tekapo itself.
- 2.2 Our reasoning for this direction was that for other applications we favoured monitoring streams downstream of irrigation areas for periphyton. However in this case there did not appear to be a suitable perennial stream/river site downstream of the irrigation area prior to entering Lake Tekapo. We concluded that Mailbox Swamp Creek was not a suitable site for 'local' monitoring on the basis that it was only sustained by irrigation bywash in summer, which would cease on conversion to spray.
- 2.3 We favoured the monitoring of Pierce Pond as an alternative to stream monitoring on the basis that, other than Lake Tekapo itself, Pierce Pond is the critical ecosystem potentially affected by the irrigation. We also considered that it was small enough to be a 'local' measure of effects, which puts less emphasis on uncertain modelling. We also concluded that monitoring Pierce Pond will serve a dual purpose of providing a more local context to the applicant's activities and providing an early warning of excessive nutrient loads entering Lake Tekapo.
- 2.4 Notwithstanding the above, we noted that we have not visited Glenmore Station and are relying on evidence and interpretation of aerial photos in arriving at our conclusion. Before finalising conditions, therefore, we sought the applicants view on Pierce Pond as a monitoring site for the effects of their activities. The alternative, as we saw it, was a more suitable 'downstream' stream monitoring site than Mailbox Swamp Creek and/or monitoring of Lake Tekapo itself.

## **3 APPLICANT'S RESPONSE**

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- 3.1 In response to our Interim Decision, we received a letter from Will and Emily Murray addressing the issues raised above. In addition, the applicant provided a memorandum from Adrian Meredith, ECan Principal Water Quality Scientist setting out Dr Meredith's view on the issue.
- 3.2 The applicant is firmly of the view that the most suitable downstream monitoring site relating to nutrients and thresholds is Mailbox Swamp Creek. The proposed site for testing is E2307759 N5697522, which is located in close proximity to the inflow of Mailbox Swamp Creek to Pierces Pond. This is equivalent to map reference NZMS 260 I37: 07759-97522. This location was chosen on the basis that it will have the best base flow and is that Mailbox Swamp Creek is the only site that has a real and direct link with irrigation on Glenmore Station.
- 3.3 In relation to the concern expressed in our Interim Decision that Mailbox Swamp Creek may dry up in summer, the applicant acknowledged that this was the evidence presented at the hearing. However it told us that the issue had since been discussed at length with Mr Jim Murray who has a long standing association with Glenmore Station. Mr Murray confirmed that Mailbox Swamp Creek is spring fed and that the flow has never diminished or dried up, even during severe drought in the summer months before border dyke irrigation commenced on the Station (pre-1970). On the basis, the applicant considered that there was no reason why Mailbox Swamp Creek would not be a suitable monitoring location.
- 3.4 In relation to the alternative of Pierces Pond, the applicant considered that this was not a suitable monitoring location for two reasons. The first is that it is owned by the Department of

Conservation and that the applicant therefore does not have control over or access to this area. The second was that the pond is a habitat for, at times, thousands of geese and duck, which may have a significant detrimental effect on the water quality of Pierces Pond that is unrelated to irrigation on Glenmore Station. The applicant also considered that monitoring Lake Tekapo itself was not suitable, as the size of the lake would make it very difficult to monitor the direct impact of the applicant's irrigation.

- 3.5 In respect of the monitoring parameters and methodology, the applicant considered that these should remain the same as those proposed in the conditions given that Mailbox Swamp Creek is still the proposed monitoring location.
- 3.6 Dr Meredith agreed with the applicants that Pierces Pond is not an ideal monitoring location. In addition to the reasons mentioned by the applicant, Dr Meredith noted that the water level in Pierces Pond is actively managed by the Department of Conservation for wildlife purposes and it is really an artificial lake that does not lend itself to steady trophic state monitoring.
- 3.7 Based on the information provided by the applicant, Dr Meredith agreed that it appears reasonable to conduct monitoring at the lower end of Mailbox Swamp Creek as a representative monitoring site. He recommended that the specific site should be as close as possible to Pierces Pond, yet also being a steadily flowing site unaffected by ponding of Pierces Pond at high water levels.
- 3.8 In relation to monitoring parameters and methodology, Dr Meredith recommended that monitoring should include both soluble nutrients and total nutrients to measure potential impacts on the instream environment and the downstream lake environment. Some assessment of growths at the creek site should also be made. Although he agreed that monitoring was appropriate, he considered that it did not need to be too onerous or rigorous given that the changes proposed by these applications were likely to be beneficial in relation to nutrient loss compared to past activities.
- 3.9 Finally, in relation to potential monitoring of Lake Tekapo, Dr Meredith considered that given the scope of the applicant's activities and the ongoing nature of them, they were unlikely to cause any measurable change in the condition of Lake Tekapo. He therefore considered that it was not crucial for the applicant to independently monitor Lake Tekapo TLI. He noted, that in any case, ECan were conducting State of the Environment monitoring in Lake Tekapo, and that while there were no guarantees this monitoring would continue, the applicant could request this data.

#### **4 OUR CONSIDERATION**

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- 4.1 We accept the applicant's response and reasoning for choosing Mailbox Swamp Creek as the best site for monitoring the effects of their activities. We appreciate Dr Meredith's input and support of the applicant's position. We also agree that with monitoring of Mailbox Swamp Creek, additional monitoring of Lake Tekapo is not required, particularly in light of the lake monitoring that is already being carried out ECan.
- 4.2 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, including monitoring of Mailbox Swamp Creek.
- 4.3 As Mailbox Creek is classified as a Hill-fed Upland Stream in the operative NRRP, then appropriate trigger values are 50 mg/m<sup>2</sup> chlorophyll a (Table WQL5), 0.21 mg/L DIN and 0.006 mg/L DRP (Table WQL16). As the periphyton trigger value (chlorophyll a) is representative of oligotrophic conditions, we see no value in setting an early warning trigger. We have modified the agreed condition set to reflect the operative plan classification and a standard trigger.

#### **Other Conditions**

- 4.4 We provided discussion on the appropriate conditions in our Interim Decision. We have several points of clarification to make relating to fish screens, annual volumes and setbacks.
- 4.5 In our Interim Decision we held that a fish screen should be installed at the point of diversion on the basis of Ms Bartlett's recommendation. However, in referring to the agreed conditions table to complete this decision, we noted that Ms Bartlett accepts that no fish screen is required on the diversion provided it is of limited duration.

- 4.6 We agree that this is an appropriate response that is consistent with other decisions we have issued involving conversions. As the activity has been occurring for some time with no fish screen in place, we are comfortable letting this continue for a limited period provided that appropriate fish exclusion measures are implemented at the time of conversion to spray. We have provided alternative conditions to this effect that provide flexibility to the consent holder depending on whether or not a gallery intake structure is used.
- 4.7 In relation to annual volumes, we identified the annual volume applied for as 1,205,180 cubic metres, including for race losses. However this race loss volume was based on 10% of the total take, including stock water. As we specifically excluded stock water from our decision, this should not have been included when determining the volume for race losses. The correct annual volume should be 1,092,500 m<sup>3</sup>/year for irrigation, with an additional 109,250 m<sup>3</sup>/year (being 10% of the total) for race losses during the five year period when open canals remain.
- 4.8 Finally, in our Interim Decision we accepted a 50 m setback from streams. In finalising this decision we have had the opportunity to review stream setbacks. On reflection we do not think that a 50 m setback or buffer from streams is warranted. In reaching this conclusion we have reviewed again the evidence of Mr Glasson and Mr Craig. Mr Glasson does not we think provide cogent reasons for the 50m setback nor did he identify the streams concerned. Taking into account Mr Craig's evidence that irrigation activity has been occurring on site for a considerable period of time, we consider that a 50 m setback is not required and have imposed our standard condition requiring a 5m setback from all streams.

#### Duration

- 4.9 In relation to the duration of the consents, for those applications affecting the Ahuriri Arm of Lake Benmore, we imposed a common duration of April 2025 due to the sensitivity of the affected environment, namely the Ahuriri Arm, and the level of knowledge about the affected environment. However, for the reasons given in our Interim Decision regarding water quality effects, we do not think that this same consideration applies to applications such as this draining to Lake Tekapo.
- 4.10 We have therefore granted the take and use consent (CRC052502) with a duration of 35 years as sought by the applicant. However, we have granted the other applications for a limited duration of five years, as all of these activities should cease once the applicant converts to spray. We did not consider it appropriate to grant these consents for a longer term when the proposal was presented on the basis that they would not continue beyond five years from the commencement of consent.

## 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** the following applications by Glenmore Station Limited:
- (a) **CRC052501** – to divert water into an existing water race;
  - (b) **CRC052502** – to take and use the water to irrigate 180 ha of pasture and forage crops at Glenmore Station, Godley Peaks Road, Lake Tekapo;
  - (c) **CRC052503** - to discharge emergency overflow to Mailbox Swamp Creek; and
  - (d) **CRC073109** – to undertake works in the bed and banks of the Cass River.
- 5.2 Pursuant to section 108 RMA, the grant of consent is subject to the conditions specified at **Appendices A to D** respectively, which conditions form part of this decision and consent.

- 5.3 The duration of consent CRC052502 shall be for 35 years from the commencement of the consent.
- 5.4 The duration of consents CRC052501, CRC052503 and CRC073109 shall be 5 years from the commencement of the consent.

**DECISION DATED AT CHRISTCHURCH THIS 7TH DAY OF MAY 2012**

Signed by<sup>1</sup>:

Paul Rogers



Dr James Cooke



Edward Ellison



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<sup>1</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

### Conditions of Consent (CRC052501)

#### Diversion of water

1. Water for irrigation shall only be diverted from the Cass River at surface water abstraction point I37/0055, at or about map reference NZMS 260 I37: 062-007 at a maximum rate of 230 litres per second, with a volume not exceeding 19,872 cubic metres per day and 1,201,750 cubic metres between 1 July and the following 30 June.
2. 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

3. The consent holder shall, before the start of the next irrigation season following the commencement of this consent, install:
  - (a) a water level measuring device in a location that will enable the determination of the continuous rate of flow and volume of water being diverted to within an accuracy of ten percent; and
  - (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.
4. 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.
5. 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.
6. The measuring and recording device(s) specified in Condition 3 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.
7. No data in the recording device(s) shall be deliberately changed or deleted.
8. All practicable measures shall be taken to ensure that the water meter and recording device(s) specified in Condition 3 are at all times fully functional and meet the accuracy standard stated in that condition.

9. Within one month of the installation of the measuring or recording device(s) specified in Conditions 3 (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.
10. 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.

**Administrative conditions**

11. 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.
12. The lapsing date for the purposes of section 125 of the Resource Management Act shall be five years from the commencement of this consent.

## APPENDIX B

### Conditions of Consent (CRC052502)

#### Take and use of water

1. For the period up until conversion to spray irrigation or five years from the commencement of this consent, whichever occurs first:
  - (a) Water taken and used shall only be water that is diverted in accordance with consent CRC052501;
  - (b) Water shall only be used for the border dyke irrigation of 180 hectares of crops and pasture for grazing sheep, beef cattle, deer or non-milking dairy cows per irrigation season within the area of land shown on attached **Plan CRC052502A**, which forms part of this consent.
2. On conversion to spray irrigation or at five years from the commencement of this consent, whichever occurs first:
  - (c) Water shall only be taken from Cass River at surface water abstraction point I37/0055, at or about map reference NZMS 260 I37: 062-007 at a maximum rate of 230 litres per second, with a volume not exceeding 19,872 cubic metres per day and 1,092,500 cubic metres between 1 July and the following 30 June.
  - (d) Water shall only be used for the border dyke irrigation of 180 hectares of crops and pasture for grazing sheep, beef cattle, deer or non-milking dairy cows per irrigation season within the area of land shown on attached **Plan CRC052502A**, which forms part of this consent.
  - (e) the consent holder shall take all practicable steps to:
    - i. Ensure that the volume of water used for irrigation does not exceed that required for the soil to reach field capacity; and
    - ii. Avoid leakage from pipes and structures; and
    - iii. Avoid the use of water onto non-productive land such as impermeable surfaces and river or stream riparian strips.
3. There shall be a minimum 5 metre setback, where there is no irrigation, from any permanently flowing waterways within the irrigation areas marked on Plans CRC052502A and CRC052502B.

#### Conversion

4. The consent holder shall within a period of five years from the commencement date of this consent, convert to spray irrigation and advise the Canterbury Regional Council as to the staging of any conversion.
5. Any rights to continue border dyke irrigation shall cease five years from the date of this consent.
6. The consent holder shall advise the RMA Compliance and Enforcement Manager at the Canterbury Regional Council of the completion of the conversion prior to the commencement and use of the new completed spray system.

#### Water metering – Take of water

7. On conversion to spray irrigation or at five years from the commencement of this consent, whichever occurs first, the consent holder shall 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 Cass River 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.
- 8. If the water meter specified in Condition 7 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.
- 9. The measuring and recording device(s) specified in Condition 7 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;
  - (c) be maintained throughout the duration of the consent in accordance with the manufacturer's instructions; and
  - (d) be accessible to the Canterbury Regional Council at all times for inspection and/or data retrieval.
- 10. No data in the recording device(s) shall be deliberately changed or deleted.
- 11. All practicable measures shall be taken to ensure that the water meter and recording device(s) specified in Condition 7 are at all times fully functional and meet the accuracy standard stated in that condition.
- 12. Within one month of the installation of the measuring or recording device(s) specified in Condition 7 (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.
- 13. 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

14. Within a period of 5 years from the commencement date of this consent and on conversion to spray irrigation (whichever occurs earlier) the consent holder shall either:
- (f) install a fish screen on the intake that complies with conditions 15; or
  - (g) ensure that water is abstracted using a gallery intake that complies with condition 16.
15. Any fish screen must comply with the following requirements:
- (h) The fish screen shall have a maximum mesh width and height size of 3 millimetres or slot width and height of 2 millimetres across the intake to ensure that fish and fish fry are prevented from passing through the intake screen.
  - (i) 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.
  - (j) The fish screen shall be designed and installed to ensure that:
    - i. the majority of the screen surface is oriented parallel to the direction of water flow; and
    - ii. 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
    - iii. 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
    - iv. the sweep velocity parallel to the face of the screen shall exceed the design approach velocity.
  - (k) The fish screen shall be designed or supplied by a suitably qualified person who shall ensure that the design criteria specified in Conditions 14 to (j) 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.
  - (l) 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 14 to (j) inclusive of this consent.
  - (m) 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.
16. In the event that a gallery intake is installed, the following conditions must be satisfied before water can be taken using that structure:
- (n) The gallery shall be designed to prevent native and exotic fish species from entering the system.
  - (o) The gallery shall be certified by a person with experience in freshwater ecology and fish screening techniques, as being designed 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.

(p) 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:

- i. Design plan for the gallery specifying gallery dimensions;
- ii. Detail of depths and sizes of layers of gravel over the gallery;
- iii. Photographic evidence of key stages of construction of the gallery, including demonstrating compliance with gravel specifications in sub clause (c)(ii) above; and
- iv. Any ongoing maintenance required by the manufacturer is carried out in accordance with their specifications.

(q) 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**

17. For the purposes of interpretation of the conditions of this consent Glenmore Station shall be defined as the areas in certificates of title and Pastoral Lease numbers 3156, 458604 and CB30A/656, which total approximately 18,828 hectares.

18. The consent holder shall prepare once per year:

(r) an Overseer<sup>®</sup> nutrient budgeting model report not less than one month prior to the commencement of the irrigation season; and

(s) a report of the annual farm nutrient loading for Glenmore Station using the model Overseer<sup>®</sup> (AgResearch model version number 5.4.3 or later).

19. When undertaking the modelling outlined in Condition 18, the consent holder shall use either weather records collected on-farm or from constructed data from the nearest weather station.

20. A copy of the reports prepared in accordance with Condition 18 shall be given to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager within one month of their completion.

21. Following conversion the consent holder shall not commence annual 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 18 from Glenmore Station does not exceed 14,000 kg of Nitrogen and 300 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.

22. The NDAs, incorporating any reductions required by receiving water quality nutrient trigger conditions, shall be complied with from the earlier of the first full year (1 July to 30 June) following completion of the irrigation conversion or five years from the commencement of consent.

23. 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

24. 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 Glenmore Station, a copy of which is attached to these conditions and marked **CRC052502-A** and forms part of these conditions.

25. Subject to Condition 24, the consent holder shall implement, and update annually the FEMP for Glenmore 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 Glenmore Station Overseer model inputs specified in the attached FEMP (Appendix A) - Glenmore Station Overseer® parameter report. Appendix A forms part of this consent.
  - (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.
26. 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.
27. 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 23 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.
28. Changes may be made to the Glenmore 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**

29. 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 18,828 hectares. The recalculated NDAs shall be undertaken to accurately redistribute the NDA between the resultant properties and shall replace the NDAs specified in Condition 21. 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 21. 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**

30. 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.
31. 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.
32. 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.
33. Nitrogen fertiliser shall not be applied to land between 31<sup>st</sup> May and 1<sup>st</sup> September except for the use of nitrification inhibitors.
34. 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.
35. Applications of nitrogen fertiliser shall not exceed 50 kg nitrogen / hectare per application.
36. 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.
37. Fertiliser filling areas shall not occur within 50 metres from a water course, spring or bore.
38. For land based spreading, fertiliser should not be applied within 20 metres of a watercourse.
39. Where practicable, the consent holder shall:
- (t) use direct drilling as the principal method for establishing pastures; and
  - (u) sow and irrigate all cultivated areas within the irrigation area as soon as possible following ground disturbance.

#### **Irrigation Infrastructure**

40. 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.
41. Within two months of the testing referred to in Condition 40(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.
42. 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**

- 43. 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.
- 44. 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.
- 45. 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.
- 46. 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.
- 47. 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.
- 48. 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**

- 49. The water quality of Mailbox Swamp Creek shall be monitored within six months of the first exercise of this consent as follows:
  - (a) The location for monitoring of Mailbox Swamp Creek 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 260 137: 061-006 immediately upstream of the intake on the Cass River.
    - ii. Map reference: NZMS 260 I37: 07759-97522 at Mailbox Swamp Creek downstream of the discharge and immediately upstream of the inflow of Mailbox Swamp Creek to Pierces Pond.
  - (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.
50. If the monitoring undertaken in accordance with Condition 49 shows that the average sample result for the downstream monitoring site specified in Condition 49 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*/ 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.
51. The report referred to in Condition 50 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.
52. If both the authors of the report prepared in accordance with Condition 50 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.

53. If the report prepared in accordance with Condition 50 concludes that the environmental standard trigger has been exceeded because of farm land use practices, then:
- (a) the NDA, as specified in Condition 21, 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. 180 irrigated hectares divided by the total farm area of 18,828 hectares); and
  - (b) the consent holder shall prepare and implement a Remedial Action Plan in accordance with Condition 55.
54. If a required reduction in nutrient load is in effect under 53(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*/ 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 or equal to 0.21 mg/L of DIN; or 0.006 mg/L of DRP; or 50 mg chl *a*/ m<sup>2</sup> (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 21 shall be restored.
55. In relation to the Remedial Action Plan referred to in Condition 53(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*/ m<sup>2</sup> (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.

#### **Review of conditions**

56. 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.

#### **Lapse**

57. 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.*

## APPENDIX C

### Conditions of Consent (CRC052503) – Discharge

#### Scope

1. Water shall only be discharged to Mailbox Swamp Creek at or about map reference NZMS I37: 0675-9803 as shown on Plan "CRC051502A":
2. The discharge shall only be unused conveyance water and shall contain no contaminants.
3. Water shall only be discharged at a rate not exceeding 230 litres per second.

#### Operation and maintenance

4. All practicable measures shall be undertaken to avoid erosion of the bed or banks of Mailbox Swamp Creek channel occurring as a result of the discharge.
5. In the event of any erosion occurring to the bed or banks of Mailbox Swamp Creek channel, as a result of the discharge, the consent holder shall be responsible for rectifying the situation as soon as practicable.
6. The discharge shall not occur in a manner likely to cause erosion of, or instability to, the banks or bed of the Mailbox Swamp Creek; or reduce the flood-carrying capacity of the waterway
7. The discharge, after reasonable mixing, shall not cause a change in the colour or a reduction of the clarity of the receiving water body.
8. The discharge to Mailbox Swamp Creek shall not cause flooding of Pierce Pond or adversely affect nesting birds within the Pierce Pond wetland area.

#### Administrative conditions

9. The Canterbury Regional Council may, once per year, on any of the last five working days of May or November, serve notice of its intention to review the conditions of this consent for the purposes of dealing with any adverse effect on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage.
10. The lapsing date for the purposes of section 125 shall be 5 years from the commencement of consent.

## APPENDIX D

### Conditions of Consent (CRC073109) – Works in Bed

#### Scope

1. The works shall be limited to:
  - a. The excavation of a gravel bar up to 60 metres long, 2 metres high and 3 metres wide in the bed of the Cass River, for the purpose of diverting water to an irrigation intake structure.
  - b. Excavation required to reinstate the gravel bar following a flood event
2. The works carried out in accordance with Condition 1 shall be located at the Cass River, within the area outlined as "gravel bund" on attached **Plan CRC073109** between map references NZMS 260 I37: 061-007 and I37: 062-007.

#### Operation and Maintenance

3. Prior to commencing excavation, a copy of this resource consent shall be given to all persons undertaking activities authorised by this consent.
4. Works described in Condition 1 shall take no longer than 1 day to complete associated with any one event.
5. All practicable measures shall be undertaken to prevent oil and fuel leaks from vehicles and machinery.
6. There shall be no storage of fuel or refuelling of vehicles and machinery within 20 metres of the bed of a river.
7. Fuel shall be stored securely or removed from site overnight.
8. Machinery shall be free of plants and plant seeds prior to use in the riverbed.
9. To prevent the spread of Didymo or any other aquatic pest, the consent holder shall ensure that activities authorised by this consent are undertaken in accordance with the Biosecurity New Zealand's hygiene procedures.

*Note: You can access the most current version of these procedures from the Biosecurity New Zealand website <http://www.biosecurity.govt.nz> or Environment Canterbury Customer Services.*

10. All practicable measures shall be undertaken to minimise adverse effects on property, amenity values, wildlife, vegetation, and ecological values.
11. The works shall not prevent the passage of fish, or cause the stranding of fish in pools or channels.
12. Vehicles/and or machinery shall not operate within 100 metres of birds which are nesting or rearing their young in the bed of the river. For the purposes of this condition, birds are defined as those bird species listed in **Schedule A**.
13. Works shall not be undertaken in any manner likely to cause erosion of or instability to, the banks or bed of the Cass River; or reduce the flood-carrying capacity of the waterway.
14. All practicable measures shall be undertaken to:
  - a. ensure that works do not deflect floodwaters into the berm;
  - b. to prevent the discharge of sediment to the Cass River arising from the works; and
  - c. avoid work occurring in flowing water.

### **Accidental discovery**

15. In the event of any disturbance of Koiwi Tangata (human bones) or taonga (treasured artefacts), the consent holder shall immediately:
  - a. Advise the Canterbury Regional Council of the disturbance;
  - b. Advise the Upoko Runanga of Arowhenua, Waihao and Moeraki, or their representative, and the New Zealand Historic Places Trust, of the disturbance; and
  - c. Cease earthmoving operations in the affected area until an area has been marked off around the site, and Kaumatua and archaeologists have given approval for the earthmoving to recommence. Note: This condition is in addition to any agreements that are in place between the consent holder and the Upoko Runanga (Cultural Site Accidental Discovery Protocol) or the New Zealand Historic Places Trust.
  
16. All disturbed areas on the riverbank shall be stabilised following completion of the works.

### **Administrative Conditions**

17. The Canterbury Regional Council may, once per year, on any of the last five working days of May or November, serve notice of its intention to review the conditions of this consent for the purposes of dealing with any adverse effect on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage.
  
18. The lapsing date for the purposes of section 125 shall be 5 years from the commencement of consent.

## Schedule A

South Island Pied Oystercatcher

Black Stilt

Pied Stilt

Wrybill

Banded Dotterel

Black-fronted Dotterel

Spur-winged Plover

Paradise Shelduck

Grey Duck

NZ Shoveler

Grey Teal

NZ Scaup

Black-billed Gull

Red-billed Gull

Caspian Tern

White-fronted Tern

Black-fronted Tern

White-winged Black Tern

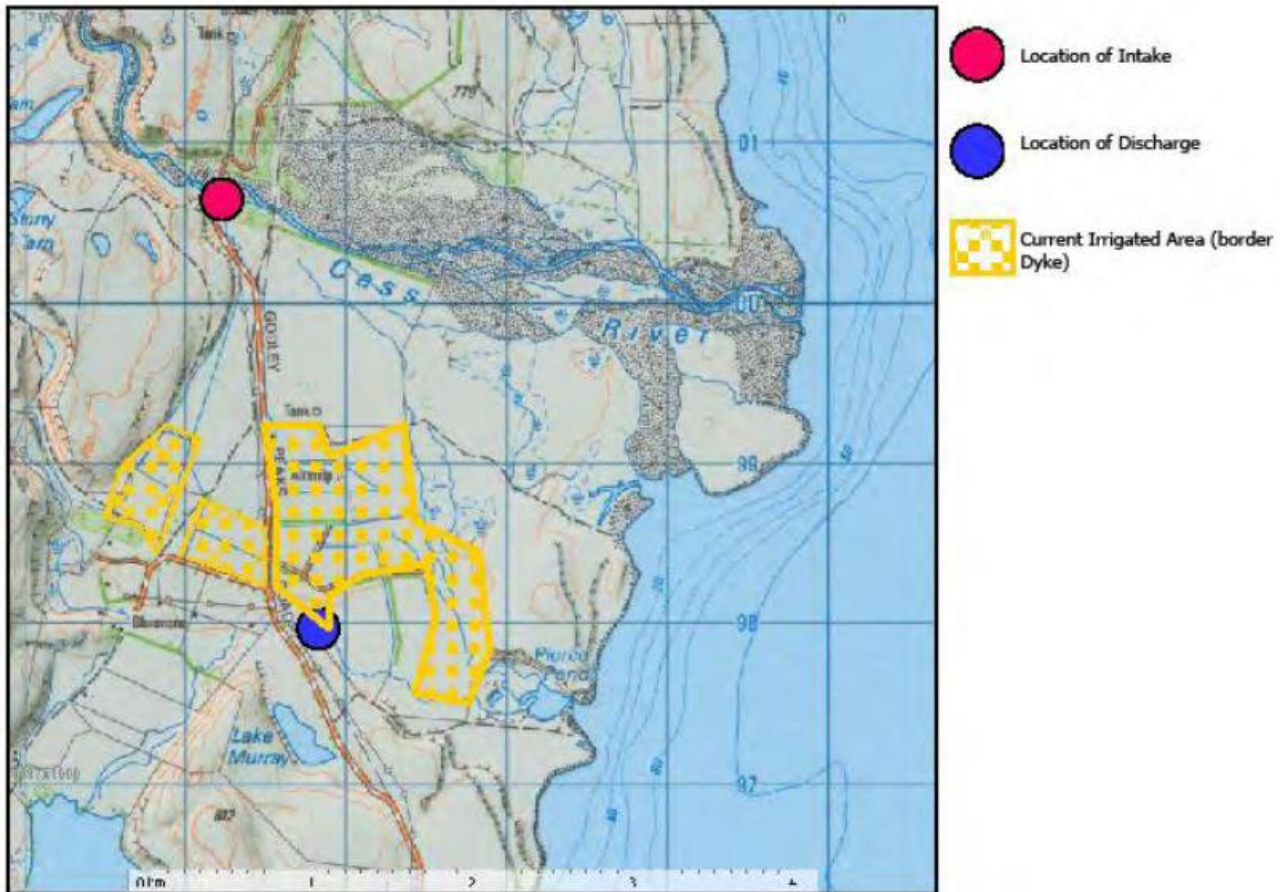
Australasian Bittern

Marsh Crake

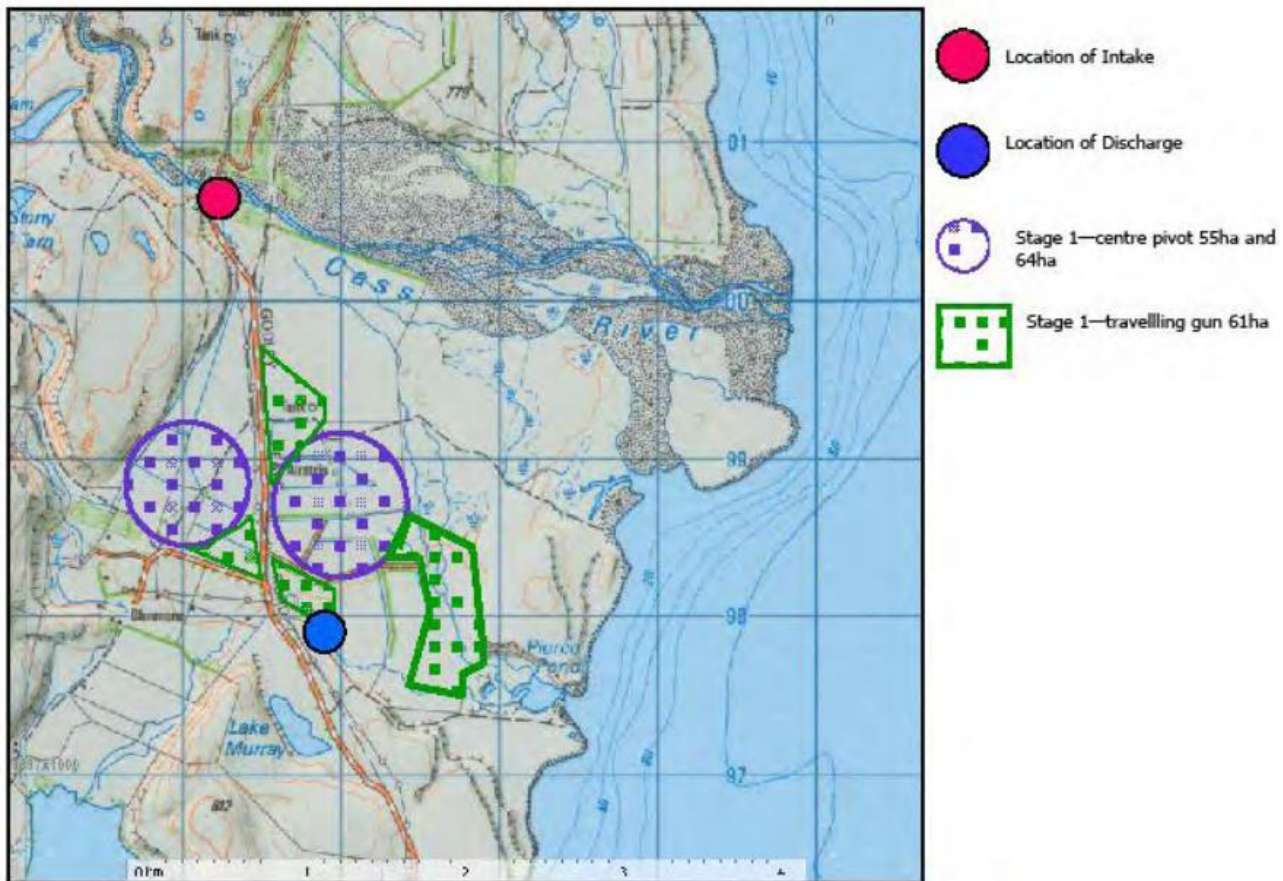
Spotless Crake

Cormorant/shag colonies

Plan CRC052502A



Plan CRC052502B





Plan CRC073109

