

# APPLICANT: BELLFIELD LAND COMPANY LTD

## (QUAILBURN STREAM)

### REPORT OF HAIDEE M<sup>C</sup>CABE

Consent ID	Description	Table 4 Location	Table 5 Location
CRC011987*	To divert, take and use water from Quailburn Stream at a maximum rate of 140l/s and a volume not exceeding 1,920,662 cubic metres per year, at or about map reference H39: 646-364. Water will be used for spray irrigation of 190 ha for grazing of sheep and beef and stock water purposes at directly west of Henburn and Quailburn Rd intersection. A 35 year duration is sought.	Quailburn tributaries.	and Upstream of Waitaki Dam but not upstream of the outlets of the glacial lakes.
<b>Activity Status</b>			
<p><u>Rule 2, Table 3 WCWARP:</u> The take is within the allocation limit set for Quailburn Stream, and accepts the minimum flow as specified in the WCWARP for Quailburn Stream.</p> <p><u>Rule 6, Table 5 WCWARP:</u> The proposed annual volume is within the allocation limit for "Upstream of Waitaki Dam, but not upstream of the outlets of the glacial lakes".</p> <p><b><u>Overall status:</u> Any activity that complies with Rules 2 and 6 is a discretionary activity as per Rule 15</b></p>			
Consent ID	Description		
CRC012733	To discharge up to 140 litres per second of excess bywash water and stock water into tributaries of Quailburn Stream at or about map references NZMS H39:648-362 (by-wash), and H39:650-347(Cookes Pond). A 35 year duration is sought.		
<b>Activity Status</b>			
<p><u>TRP:</u> There is no operative regional plan so S77C of the RMA applies, and the activity is <b>discretionary</b>.</p> <p><b><u>Overall status:</u> Discretionary</b></p>			

# 1 PROPOSAL

1. Bellfield Land Company Ltd (herein referred to as the applicant) farm Quailburn Downs, between the Henburn and Quailburn Rd, between Omarama and Twizel.
2. The applicant seeks the renewal of existing consents WTK702041 A, B and C. These authorise the take and use of 140l/s from the Quailburn Stream for the spray irrigation of 190 hectares for grazing sheep and beef and stockwater. Furthermore they seek to discharge excess bywash water into tributaries of the Quailburn Stream.
3. The applicant has owned the property since 2006 at which time wild flood and K-line irrigation from several water races was occurring. The old inefficient system is now generally avoided until a spray system replaces it completely. 95Ha has recently been replaced by a pivot irrigator and a piped stock water system in this area.
4. The existing irrigation command area is shown in Appendix A.
5. Water is raced at up to 140l/s from the Quailburn Stream to a small holding pond, this section of race is currently proposed to remain. There are no works carried out in the stream as it naturally diverts into the race. Recently the lower race has been cleaned out which is now the only race used. The top race is redundant as its main purpose had been for stockwater that is now piped.
6. The taking of water is controlled and regulated by a manually operated underflow gate and induces by-wash to ensure that any water diverted in excess of that consented, or required to be taken, is immediately discharged back into Quailburn Stream.
7. It is proposed to upgrade the intake on granting of this consent, to enable required metering and to meet fish screen requirements.
8. Water is then taken for the pivot from the pond via a pump and piped to the pivot irrigator. Excess water from the pond is by-washed back into the Quailburn system.
9. The flow rate of 140l/s is still required even though the volume proposed has been decreased to meet efficiency requirements. However given the hydrology work carried out on potential restrictions of taking water in accordance with the minimum flow, restrictions may occur regularly in late summer. Therefore when water is available it needs to be taken quickly, and it may mean that in time the buffer pond will be upgraded to a larger dam to overcome potential restrictions.

## 1.1 Timeline and Summary of Significant Amendments made to the Applications

<b>Timeline</b>	<b>CRC011987 and CRC012733</b>
<b>Date of Lodging</b>	29 March 2001
<b>First Notifiable Date</b>	15 November 2004
<b>WCWARP Notifiable Date</b>	15 December 2006
<b>Public Notification</b>	4 August 2007

10. The applications were lodged in March 2001, seeking the renewal of existing use rights WTK702041 A, B and C which authorised the diversion and taking of water from the Quailburn Stream at a rate of 140L/s and not exceeding 85 megalitres (85, 000 cubic metres) per week.
11. In April 2007, an annual volume of 2,835,520 cubic metres per year for irrigation purposes and stock water purposes was clarified and an area of 208 Ha.
12. As a result of discussions with Meridian Energy Ltd regarding derogation approval, this was amended to 2,365,480 cubic metres per year and 190Ha in December 2008. The stock water was also reduced to 362,880m<sup>3</sup>/season.

13. Furthermore the minimum flow for the Quailburn Stream as defined in Table 3 of the WCWARP was accepted.
14. The intake locations and discharges required have also been refined during this evidence to what is actually now required.
15. On the 22 June 2009, the volume of irrigation water required was further reduced to 1,557,782m<sup>3</sup>/season in accordance with the volume determined by Irricalc. The stockwater divert and discharge was removed from the application as no longer required: H39:649-362 and H39:655-354. Details were provided on fish screening of the intake.
16. No other changes have been made to the applications.

## **1.2 Water Source**

17. The Quailburn Catchment is located approximately 15km North-west of Omarama and drains the Diadem and Ohau Range. It has a catchment area above the minimum flow site of 82km<sup>2</sup> which is located at the Henburn Rd. The altitude of the upper catchment ranges from 500m to 1900m amsl.
18. Several tributaries, including the East Diadem and Serpentine Stream, feed into the Quailburn upstream of the gorge, then into the Ahuriri River. Flows at the minimum flow site are usually continuous; however below this site it is often dry, with surface flows often not continuous to the Ahuriri River.
19. The Quailburn provides a limited fishery for spawning and rearing habitat of rainbow and brown trout.

## **2 BACKGROUND INFORMATION**

### **2.1 Farm Situation**

20. Bellfield Land Company Ltd (herein referred to as 'the applicant') operates Quailburn Downs; a 2,200 ha freehold hill country property near Omarama. The farm is merino sheep and beef cattle with 22% of the stock made up of cattle and the remaining 78% of sheep. The farm has approximately 95 ha of existing irrigation made up of spray.
21. The applicant has proposed to provide a total reticulated stock water scheme with this proposed irrigation development to ensure that stock can be excluded from waterways.
22. The applicant is proposing to continue to farm in a similar manner with this proposed irrigation development. The proposed irrigation development will provide many benefits and some are listed below:
  - a. Fattening cattle- with an increase in the area of irrigation there can be an increase in the number of cattle fattened.
  - b. Fattening merino hoggets. The applicant currently carries all merino lambs through a winter, shears them and then fattens and sends to the freezing works. The proposed irrigation development will ensure that this can be done in dry years.
  - c. Making winter feed.
  - d. Growing crops for feed, as an example Lucerne and ryecorn.
23. The applicant has proposed to increase the stock units from the present 8,000 to approximately 9,000.

### **2.2 Derogation Approval**

24. Derogation approval was obtained from Meridian Energy Limited on the 8<sup>th</sup> December 2008 – Appendix D

### 3 COMMENTS ON SUBMISSIONS

25. These applications were again notified in December 2003, as part of the “ministerial call-in”. A total of 314 submissions were received.

26. A summary of the 2007 submissions is as follows

Resource Consent	Submissions in support	Submission in opposition	Neutral
CRC011987	2	18	2
CRC01273	2	12	2

27. Details of the submissions made in response to all applications that were publically notified at the same time in 2003 and 2007 are contained in CRC Report 1, Appendix 5. I have reviewed this report and adopt it as a true and accurate summary of the submissions received.

28. Details of the submissions received that are not common to all applications are as follows:

Submitter	Issues	Support/neutral/oppose
DW McAughtrie	There is the potential for the applicant's take to adversely affect his own in respect to the ability to abstract the consented rate of take.  Supportive of working with the applicant to establish a flow sharing regime, or another alternative to ensure that the submitter's take was not impacted on, but allowed the applicant to also take water from the Quailburn Stream.	Oppose
Ohau Company Trust Limited	The amount of water being sought will exceed the volume of water available in this water body and limit the availability of water for other uses.  They wished that the following decisions are made: a. Specify a schedule that will enable other applicants equitable use of water resources and; b. Reassess the minimum flow limits to accommodate the scheduled use of water.	Oppose
Meridian Energy Ltd	Effects on water quality, efficient use of water and the need to meter take	Oppose
Fish and Game NZ,	Quailburn is important spawning and rearing habitat for rainbow and brown trout although a limited fishery; an important contributor to the Ahuriri River; overallocated	

29. The applicant and the Government Race (CRC991473) which includes DW McAughtrie, have reached agreement and will work together in the creation of an agreed flow sharing regime.

30. Ohau Company Trust Ltd submitted against the applicant, but has since withdrawn any objection to these applications (9/7/2009).

31. In respect of the Meridian Energy Ltd submission, the applicant will install a flow meter, and has provided mitigation to ensure that effects on water quality are minor, as discussed later in this report.
32. In respect of the Fish and Game and the Department of Conservation submissions, the total allocation now being sought from the Quailburn River is within the allocation limit and minimum flow specified in Table 3 of the WCWARP.
33. Furthermore the applicant clarified recently in an email to F&G and DOC dated 26th August 2009, various details on the application. Feedback was sought but had not been received at the time of writing this evidence.

## 4 CRC011940 - TAKE AND USE CONSENT - ASSESSMENT OF ENVIRONMENTAL EFFECTS

### 4.1 Effects on other water users

Effects on other water users	
Comments	<p>This is the renewal of an existing water right. No increase in rate or weekly volume (as currently authorised) is being sought, and the applicant has proposed a minimum flow in accordance with Table 3 of the WCWARP. A flow sharing regime is being developed.</p> <p>The CRC reporting officer for these applications agrees that effects on other water users are minor</p>

34. There are two other abstractors in the Quailburn Catchment, upstream of the applicant. Quailburn Government Race (include McAughtrie), who is also seeking the renewal of an existing water right. Ohau Company Trust Ltd is also seeking water from the catchment and is a new abstractor.
35. Table 3 of the WCWARP specifies an allocation limit of 310L/s for the Quailburn and tributaries. This is the total rate of take of both the applicant and the Quailburn Government Race existing consents.
36. This allocation limit aims to ensure that where there are competing users for the resource, the effects on these users is "acceptable". While these two applications may be within the overall allocation limit for the Quailburn Catchment, there is always the potential that the two competing users could impact upon each other. Quailburn Government Race abstraction is upstream of the applicant's abstraction point.
37. Both applicants seek renewal of existing water rights, with no history of interference effects between the users, and have agreed to establish a flow sharing regime above the minimum flow in accordance with the general evidence of Mr Boraman in terms of the 2A report, this is not considered any further
38. Ohau Company Trust Ltd are seeking to take water when flows are above 1, 000L/s (B Permit), and therefore, can only take water at times when there is sufficient water for all to be abstracting.
39. This proposed takes sit within the area defined as defined as Upstream of Waitaki Dam, but not Upstream of the outlets of the Glacial Lakes in Table 5 of the WCWARP. This table sets a cumulative allocation of 275 million m3/year for this area.
40. Report 3 – Annual Allocations to Activities (Rule 6 Table 5) acknowledges that the granting of the applications subject to this hearing will not result in the cumulative allocation limit being exceeded.
41. Mitigation is proposed restricting the rate of take, volume per week and the minimum flow including flow sharing. Given this, effects on other users are considered to be minor.

## 4.2 Effects on Ecosystem values

Effects on ecosystem values	
<b>Comments</b>	<p>The applicant has proposed a minimum flow in accordance with Table 3 of the WCWARP and a fish screen will be installed in accordance with recommended guidelines.</p> <p>The CRC reporting officer for these applications agrees that effects on ecosystems are minor.</p>

42. The minimum flow along with the allocation regime, aim to ensure aquatic values are protected. The applicant proposes to accept the minimum flow for the Quailburn Stream as defined in Table 3 of WCWARP.
43. The existing users are establishing a flow sharing regime above the minimum flow in accordance with the general evidence of Mr Boraman in terms of the 2A report, above the minimum flow.
44. A water level recorder will be installed on the Quailburn Stream to enable compliance with the minimum flow and flow sharing that will be established. The take itself will also be appropriately metered
45. The intake is proposed to be fish screened in accordance with "Fish Screening: good practice guidelines for Canterbury, NIWA Client Report: CHC2007.092, October 2007".
46. The applicant considers given the conditions of minimum flow, proposed flow-sharing to manage the flows above the minimum flow and fish screen, the effects on the ecosystem values are minor.

## 4.3 Effects of inefficient water use

Reasonable and Efficient Use Seasonal Volumes and Land Use	
<b>Land Use</b>	Mixed (sheep and beef cattle)
<b>Area to be irrigated (hectares)</b>	190 ha
<b>Method of application</b>	Spray
<b>Efficiency of application</b>	80%
<b>Daily application depth</b>	5mm
<b>Return period</b>	3-7 days
<b>Return period application depth</b>	15-35mm
<b>Soil profile available water</b>	Range from 30mm-130mm (T Webb)
<b>Effective Irrigation Season Rainfall</b>	190mm/ha/yr
<b>Seasonal volume as per Irricalc (m<sup>3</sup>/year)</b>	1,557,782 m <sup>3</sup> /year (820mm/season)
<b>Seasonal volume required (m<sup>3</sup>/year)</b>	1,557,782 m <sup>3</sup> /year (820mm/season)

<b>Volume to be included in Table 5 (WAP) allocation</b>	1,557,782 m <sup>3</sup> /year (820mm/season)
<b>Comments</b>	<p>The proposed irrigation annual volume for the current system is based on a design system capacity of 1500mm/ha/year for 95ha, for a 155 day irrigation season and 6080mm/ha/yr for a further 95ha. The irrigation season length is that determined by Mr Rob Potts as the average number of days in the Upper Waitaki Catchment for a border dyke and spray irrigation system.</p> <p>The proposed irrigation annual volume is based upon Irricalc which is within derogation approval provided by MEL.</p> <p>The proposed stock water annual take and use, has been determined using Schedule WQN11 of the NRRP. The proposed stock water volume is 362,880 cubic metres and has been based on a divert of 20 l/s for the race system, proposed to be maintained between the intake and buffer pond. Excess water is discharged back into Quailburn Stream</p> <p>The CRC reporting officer for this application does not agree with the proposed irrigation annual volume for the spray system.</p>

47. The proposed application depth of 15-35mm per return period is less than 50% of the water holding capacities expected. This is considered to be an efficient use of water and the irrigation systems will be determined and managed to ensure compliance.
48. Policy 16 (c) of the WCWARP defines two alternative approaches for determining appropriate annual volumes for irrigation. These are as follows:
  - i) soil-moisture measurements, local rainfall and evapotranspiration modeling for the 1-in-5 year dry season (the year for which seasonal demand is exceeded in 20 percent of years);
  - or
  - ii) the difference between peak total seasonal demand as shown in Table A1, Environment Canterbury Report U05/15 and the effective summer rainfall exceeded 80 percent of the time from an approved rainfall site.
49. The first method described is a soil water balance approach, and the second is more commonly referred to as Schedule WQN9v2.
50. Irricalc is a soil water balance approach developed by Aqualinc Research Ltd, and who carried out the modeling for this application. This method is a daily accounting system of the water entering and exiting the soil within the root zone of a particular crop.
51. Furthermore, Irricalc models the effect of all of the factors mentioned in Policy 16(a), namely land use, soil water-holding capacity and spatial variability, spatial and temporal rainfall and potential evapotranspiration variability, as well as irrigation system operation and management.
52. The model inputs are attached to this report as Appendix F.
53. Since owning the property, the applicant has substantially reduced their volume of take and improved the system from wild flood and K-line. A 95ha pivot has replaced much of this already. The stock water volume has also been reduced given the conversion to a reticulated system from the buffer point. This is consistent with Policy 15, 18 and 28 of the WCWARP in terms of efficiency and effectiveness of use
54. The rate 140l/s (less 20l/s for stockwater/race losses) equates to a daily application rate for 190ha of just over 5mm/day. Efficiency of water use is considered to be provided for by ensuring less than 50% of PAW is applied (WP05).
55. Policy 28 recognises the value of investment of the existing consent holder, and this has to be given consideration, however, Policy 28 also requires a consent holder to take all

reasonable attempts to meet the efficiency expectations of the plan. The applicant has reduced water requirements and proposes to upgrade all the system to spray.

56. Policy 21 of the WAP requires all water takes to be metered. To ensure that this application is consistent with this policy, the applicant proposes to meter their take.
57. **Stockwater:** The applicant has applied to divert and discharge stockwater flowrates as part of the renewal of this consent application given this is a race system which has been reduced to 20l/s (including race loses).
58. The head race for this system may still be utilised in the future consequently the stockwater rate and volume of 362,880 cubic metres is still required.
59. **Conveyance Efficiency:** Policy 19 of the WCWARP encourages the piping or otherwise sealing of water distribution systems to minimise water losses. The main headrace is still proposed to be utilized and operate within 10% race losses which is considered reasonable as part of the stockwater volume.
60. Furthermore with the conversion to spray irrigation and a troughed system, water will be distributed by pipe from at least the head race/pond, to use the water efficiently and utilise the gravity available, as implemented with the existing pivot.
61. An irrigation volume proposed which is considered to meet Policy 16 of the WCWARP plus stock is considered appropriate and are both in accordance with derogation approval. The applicant has commenced improving efficiency; the beginning of spray conversion and therefore the effects of inefficient water use are considered minor.

#### 4.4 Effects of the use of water on water quality

Water Quality	
<b>Comments</b>	<p>The CRC reporting officer for these applications is not currently satisfied that effects of water quality are minor.</p> <p>Cumulative effects on water quality have been addressed by Mackenzie Water Resources Limited (MWRL) and are summarized below.</p> <p>Local effects have also been addressed below</p>

62. The property, according to the MWRL Water Quality Study, is located within the Henburn and Quailburn catchment and Henburn, Quailburn and Ahuriri Surface water catchments. For this property, the Lake Benmore mitigation requirements are the most stringent and are accounted for in the overall property threshold from the MWRL Study.
63. The calculated nutrient mitigation requirement of the receiving environments determined in the MWRL Study has identified the N and P thresholds for the property. These are shown in the table below.
64. "OVERSEER® has been run a qualified person to model the N and P outputs from the proposed farming system. The results of the model have been incorporated in to the table below. This table shows that the applicant can meet the property thresholds which are the most restrictive.

	Nitrogen Threshold	Phosphorous Threshold
MWRL Water Quality Study Property Thresholds	7355	207
OVERSEER® Outputs	7351	196

65. The applicant is committed to implementing the "Mandatory Good Agricultural Practices" set out within the FEMP (see Appendix E). Implementing these practices ensure that the

OVERSEER® results are validated. This along with ensuring that the property thresholds of the WQS (set out in the table above) are not exceeded will ensure that the cumulative effects of the use of water for irrigation on water quality are no more than minor.

66. Whilst the applicant is within their property thresholds, the MWRL Study identified that the applicant still has to consider specific on farm effects and the impacts these activities could have on the local receiving environment. This requires a specifically developed Farm Environmental Management Plan (FEMP) to identify and implement appropriate mitigation measures set out in the draft attached (see Appendix E).
67. At a workshop held in Twizel in August 2009, the applicants met with Ms Melissa Robson of GHD Limited. A “desk top” on farm risk assessment was undertaken. This is considered to be the “starting point” of the FEMP.
68. The workshop identified potential on farm risks specific to each farm along with possible mitigation measures. The on farm risks identified during the desktop risk assessment need to be verified by an appropriately qualified person who has carried out a site visit. It is anticipated that this will occur should the application be granted. Desktop risks and draft mitigation mitigation already identified have been outlined in the evidence of Ms Scanlan.
69. For Quailburn Downs, the desktop risk assessment identified the following potential risks:
  - Evidence of erosion
  - Runoff from winter feed crops
  - Laybacks from waterways from fertiliser application – how is this communicated?
  - Location of troughs
  - Soil post ryecorn
  - Track runoff - check
  - Cookes Pond
  - Buffer from Quailburn Stream; identify on map and photos
70. The applicant has committed to implementing the FEMP including an on farm risk assessment, appropriate mitigation, monitoring and auditing before the first exercise of this consent. The FEMP has been proposed as condition of consent and the draft FEMP is attached to this evidence as Appendix E.
71. Draft mitigation has already been indentified by the applicant and are summarized below:
  - a) 20mtr buffer from waterways when applying fertilisers within irrigation area
  - b) Irrigation buffer from Quailburn Stream of at least 20mtrs
  - c) Riparian fencing and planting at strategic locations
  - d) GPS spreader and maps used when applying fertiliser
72. Given that the N and P thresholds from the MWRL Study can be met, and the applicants commitment to addressing on farm risks with the implementation of the FEMP, the effects of the use of water on water quality for both the local receiving environment and cumulative effects are considered to be minor.

#### 4.5 Effects on Landscape

Effects on Landscape	
<b>Comments</b>	<p>Landscape effects have been addressed by UWAG’s Landscape Architect, Mr Andrew Craig, who considers that this proposal will have a minor effect on landscape values.</p> <p>The CRC reporting officer for these applications considers that effects are acceptable with appropriate mitigation.</p>

73. Mr Andrew Craig is a landscape architect who is providing general and specific recommendations on behalf of UWAG clients to this hearing. His conclusions reflect that the general effects on the MacKenzie landscape of these further applications within the basin will be significantly less than minor. I adopt his recommendations to the committee. In terms of the specific placement of the irrigation structures associated with this application, I confirm the following:
- a) The irrigation area proposed is already part of a substantially modified environment, whereby land has been progressively cultivated and re-grassed, top dressed, new fences, existing irrigation including a centre pivot.
  - b) The irrigation area was modified to ensure it was outside the area classified as “Outstanding Natural Character”
  - c) As part of the FEMP a buffer from the Quailburn Stream will be developed
  - d) The irrigation development is not considered visible from the State Highway
  - e) The existing pivot irrigator is already operating within proximity to the no exit Henburn Rd.
  - f) The ridgeline is unaffected by the development
74. Therefore, it is concluded that effects on landscape values will be minor.

#### 4.6 Effects on People, Communities and Amenity Values

Effects on People, Communities and Amenity Values	
<b>Comments</b>	The CRC reporting officer for these applications considers that effects are acceptable with mitigation

75. The applicant has proposed the minimum flow as specified in the WCWARP for the water body from which they have applied to take and use water. A minimum flow is designed to adequately protect people, community and amenity values.
76. The activities all occur in a rural setting, where the dominant land use is pastoral farming. Given that the proposed activities all occur on private farmland; as such the use of water is unlikely to adversely affect amenity values.
77. The WCWARP sets an annual allocation “cap” for agricultural and horticultural activities within defined areas (Table 5) which in Section 5.1 is considered to be met. The applicant has proposed an annual allocation limit for their own resource consents for the use of water.
78. Water quality is addressed in Section 5.4 in terms of cumulative and individually with the FEMP and landscape has been considered with Section 5.5
79. Therefore, given the applicant’s commitment to ensuring efficient use of water on their properties, to the minimum flow and flow-sharing regime protect in-stream values and other users, it is considered that effects on people, communities and amenity will be minor.

#### 4.7 Effects on Tangata Whenua Values

80. Te Runanga O Ngai Tahu submitted on all applications in the catchment, seeking that all applications be declined.
81. The primary reasons for this were that the applications were considered to be inconsistent with the policies and objectives of the WCWARP, and also at odds with the cultural objectives of the RMA.
82. This application is considered to be within the allocation limits and in accordance with the minimum flows of the WCWARP. Te Runanga O Ngai Tahu had considerable input into the creation of the WCWARP.

83. An email was sent to Paul Horgan on the 26th August 2009, outlining the proposal and any changes made since notification. Feedback was sought but not received at the time of writing this evidence.
84. However, it is acknowledged that Te Runanga O Ngai Tahu have a significant relationship with the Waitaki Catchment, and as such, appropriate minimum flow conditions, and management of water quality effects, is proposed by the applicant to ensure that the potential effects on the environment, including tangata whenua values are minor.

## **5 CRC012733 – DISCHARGE CONSENT - ASSESSMENT OF ENVIRONMENTAL EFFECTS**

85. The potential effects considered to be relevant to this activity are as follows:

### **5.1 Effects on flood carrying capacity and bank erosion**

86. When water is discharged into a waterway, the flow, and potentially the velocity, of the receiving water body is increased, thereby increasing the volume of water in the water body and potentially scouring the banks where the discharge occurs.
87. The two discharge locations proposed are either into the main stem of Quailburn Stream which has a good stable stone base or Cookes pond which is a swampy/marshy area. This discharge has the positive effect of helping to sustain this aquatic environment.
88. The two discharges are well established and have been operating since the early 1970's without adverse effects on erosion to these locations. There is no evidence of erosion under the current practice. The discharge is proposed to continue essentially in the same manner, however the discharge into Cookes pond will diminish in time with the proposed upgraded intake structure and the conversion to spray irrigation and piped stock water.
89. The Cookes pond discharge will be very minimal if not, non-existent with a consent only required for emergency type situations
90. Given this, erosion of the bed and banks of the tributaries of Quailburn Stream from the discharge of water is unlikely to occur, and effects should be minor.
91. These discharges are considered very minor in terms of the receiving environments whereby these discharges have been operated at a higher rate of discharge for nearly 40 years. Therefore the effect on the flood carrying capacity is considered minor.
92. Given this, flood carrying capacity and erosion from the discharge of water is unlikely to occur and is considered minor.

### **5.2 Effects on ecosystem values and water quality**

93. The water that is discharged into the Quailburn Stream tributaries is excess water that has been diverted. It is un-used (i.e. it has not been used for irrigation prior to the discharge occurring). Therefore, it is of the same quality as that being diverted, and therefore, the quality of water in the tributaries of Quailburn Stream should remain unaltered.
94. With the upgrade to spray irrigation, in time this discharge will reduce to fairly much stock water only or for emergency situations.
95. As part of the Farm Environmental Risk Assessment to be conducted to finalise the FEMP, these discharges will be considered further. Further details are provided in the draft FEMP, Appendix E.
96. Given this, effects on water quality and ecosystems are considered to be minor, as concurred by Reporting Officer

### **5.3 Effects on amenity, people, communities and Tangata Whenua values**

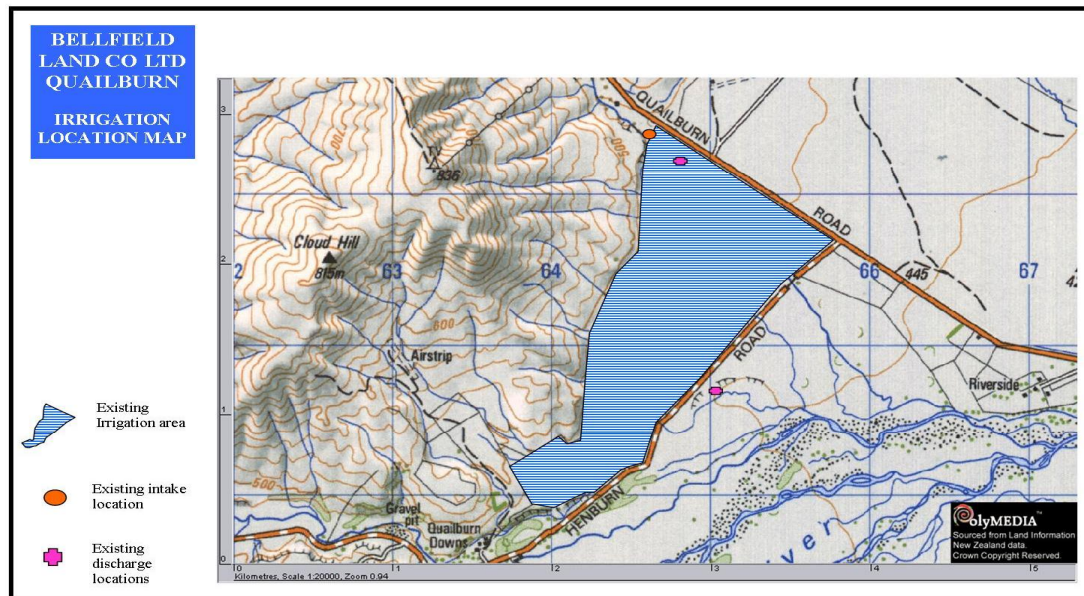
97. When water is discharged there is the potential to cause adverse effects on other users of the water body due to the contamination of the water, or create an unsightly plume that may affect amenity.
98. In this case, the receiving water body is tributaries of the Quailburn and Ahuriri River before entering Lake Benmore. The volume discharged is a very small volume of water in proportion to the volume of water in the river and lake which will reduce further once the full spray system is operational.

99. This has been occurring since the early 1970's and the effects are decreasing with the system upgrade as already discussed in the sections above.
100. Therefore, effects on amenity, people, communities and Tangata Whenua values are minor.

## **6 CONCLUSIONS**

101. The potential effects associated with the take and use of water, and the related ancillary activities of discharging water have been assessed, and are considered to be minor.

# APPENDIX A: COMMAND AREA OF EXISTING IRRIGATION AT QUAILBURN DOWNS



## APPENDIX B:

Photo 1: Existing irrigation area



Photo 2: Existing pump station



## APPENDIX C: PROPOSED CONDITIONS

CRC Proposed conditions used with track changes

Please note that conditions relating to water quality and FEMP are still to be added

Table 3: Recommended draft conditions for water permit CRC011987		
No.	Condition Code <sup>1</sup>	Details
<b>Divert &amp; Take</b>		
1	WP01	<p><i>Name of waterbody:</i> Quail Burn</p> <p><i>Map reference:</i> NZMS 260 NZMS 260 H39:645-364 and H39:646-364</p> <p><i>Instantaneous rate:</i> 140 litres per second</p> <p><i>Volume:</i> 12,096 cubic metres per day and <del>4,594,130</del> <b>1,920,662</b> cubic metres between 1<sup>st</sup> July and the following 30<sup>th</sup> June of which 362,880 cubic metres is stock water</p>
<b>Use</b>		
3	WP04	<p><i>Type of irrigation:</i> Spray irrigation &amp; stock water</p> <p><i>Number of hectares:</i> 190 hectares</p> <p><i>Use:</i> crops and pasture for grazing stock <del>excluding milking dairy cows</del></p> <p><i>Plan No:</i> "CRC011987" (Attachment 1)</p> <p><i>Do not wish to limit stock type. FEMP will ensure N and P discharges are not exceeded.</i></p>
4	WP05	Efficiency of use
5	WP06	Backflow preventer
<b>Mitigation</b>		
6	WP07	<p><i>Name of waterbody:</i> Quail Burn</p> <p><i>Map reference:</i> NZMS 260 H39:6553-3542</p> <p><i>Minimum flow:</i> 100 litres per second</p> <p><i>Flow graph:</i> See Report 2A <i>Refer to the general evidence of Mr Boraman for corrected consent condition</i></p>
7	WP09	Fish Screen

<sup>1</sup> See Report 1, Appendix 6 for condition code and wording.  
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8		The consent holder shall ensure water races used to convey water diverted in terms of this permit are well maintained to minimise losses.
<b>Measuring &amp; Metering</b>		
9	ME03	Open channel: <b>Telemetry optional – (d ii) <u>or</u> (diii)</b> <b>May not be practical depending on network coverage, radio link and whether necessary.</b>
10	ME04	<b>Datalogger required as per MIC/MEL conditions</b>
11	ME05	
12	ME06	
13	ME07	<i>Waterway:</i> Quail Burn
14	WP08	<i>Waterway:</i> Quail Burn <i>Map reference:</i> NZMS 260 H39:6553-3542 <b>To be used with ME03-05</b>
<b>Administrative Conditions</b>		
15	AD01	
16	AD02	<i>Number of working days:</i> 5 <i>Month 1:</i> March <i>Month 2:</i> July <i>Waterbody:</i> Quail Burn <i>Cross reference to Condition:</i> 6
17	AD04	Lapse date
<b>Table : Recommended draft conditions for discharge permit CRC012733</b>		
No.	Consent Code <sup>2</sup>	Details
<b>Scope</b>		
1	DP01	<i>Waterbody from:</i> Irrigation & stock water race <i>Waterbody to:</i> Quail Burn & Cookes Pond <i>Map reference:</i> NZMS 260 H39:649-338 H39:648-362 and H39:650-347 <i>Discharge rate:</i> 140 litres per second <i>Plan:</i> "CRC012733" <i>Other:</i> The water shall be unused irrigation and stock water and shall contain no contaminants.
<b>Operation and Maintenance</b>		
2	DP02	<i>Waterbody:</i> Quail Burn & Cookes Pond
3	LU13 modified	The discharge shall not occur in a manner likely to cause erosion of, or instability to, the banks or bed of Quail Burn &

<sup>2</sup> See Report 1, Appendix 6 for condition code and wording.  
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		Cookes Pond; or reduce the flood-carrying capacity of the waterway
4	DP03	
5	<del>DP04</del>	<i>Not considered necessary</i>
<b>Administrative Conditions</b>		
6	AD03	Review
7	AD04	Lapse date