

# APPLICANT: DUNSTAN PEAKS LTD

## REPORT OF CATHY BEGLEY

Consent ID	Description	Table 3 Location	Table 5 Location
<p><b>CRC011361</b></p>	<p>To divert water from Little Omarama Stream into an irrigation race at a maximum rate of 170L/s. Once in this race the water is dammed in a header pond which holds approximately 45,000m<sup>3</sup>. To take and use from the header pond at a maximum rate of 170L/s for the border dyke irrigation of up to 30 ha of land.</p> <p>To divert water from the Omarama Stream into an irrigation race at a maximum rate of 350L/s. Once in this race the water is dammed in a header pond which holds approximately 45,000m<sup>3</sup>. To take and use from the header pond at a maximum rate of 350L/s for the border dyke irrigation of up to 115 ha of land.</p> <p>To divert water from the Omarama Stream into an irrigation race at a maximum rate of 290L/s.</p> <p>To divert water from Middle Gully into an irrigation race at a maximum rate of 60L/s.</p> <p>To take and use from the irrigation race, sourced from both the Omarama Stream and Middle Gully, at a maximum rate of 350L/s for the border dyke and wild flood irrigation of 170 ha of land.</p> <p>To divert, take and use water from Twaddles Creek at a maximum rate of 100L/s for the border dyke irrigation of 15 ha of land.</p> <p>To divert, take and use water from Twaddles Creek at a maximum rate of 45L/s for the border dyke irrigation of</p>	<p>All other rivers and streams</p>	<p>Upstream of Waitaki Dam, but not upstream of the outlets of glacial lakes.</p>

Consent ID	Description	Table 3 Location	Table 5 Location
	<p>12 ha of land.</p> <p>To divert, take and use water from the Little Omarama Stream at a maximum rate of 30L/s for stock and domestic water on Twinburn Station.</p> <p>To divert, take and use water from the Omarama Stream at a maximum rate of 115L/s for micro hydro.</p>		
<b>Activity Status</b>			
<p><u>Rule 2, Table 3 WCWARP:</u> No allocation limit is specified for “all other stream”, however an alternative minimum flow regime is being proposed which may not be a 1 in 5 year, 7 day low flow as required in the WCWARP.</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 does not comply with either Rules 2 and 6 is a non complying activity under Rule 16</b></p>			
Consent ID	Description		
CRC011361	To dam up to 45,000m <sup>3</sup> of water within each of the two existing header ponds		
<b>Activity Status</b>			
<p><u>Rule 2 WCWARP:</u> controls the damming of water. However, this rule does not set any standard by which an application to dam water can be assessed.</p> <p><b><u>Overall status:</u> Any activity that does not comply with either Rules 2 and 6 is a non complying activity under Rule 16</b></p>			
Consent ID	Description		
CRC011363	To construct and maintain a gravel weir in the bed of Little Omarama Stream, Middle Gully and Twaddles Creek to facilitate the diversion of water and to maintain existing intake structures.		

Activity Status	
<p>TRP: There is no operative Regional Plan so S77C of the RMA applies, and the activity is considered to be a discretionary activity.</p> <p>The proposed activity was lodged before Variation 1 to the pNRRP was notified. As such it is considered in appropriate to use this document to determine the status of the application.</p> <p><b><u>Overall status:</u> Discretionary</b></p>	
Consent ID	Description
CRC011362	To discharge up to 150L/s of unused water into Twaddle Creek.
Activity status	
<p>TRP: There is no operative Regional Plan so S77C of the RMA applies, and the activity is considered to be a discretionary activity.</p> <p>The proposed activity was lodged before Variation 1 to the pNRRP was notified. As such it is considered in appropriate to use this document to determine the status of the application.</p> <p><b><u>Overall status:</u> Discretionary:</b></p>	

## 1 PROPOSAL

1. Dustan Peaks Ltd (heron in referred to as “the applicant”) applied for CRC011361, CRC011362 and CRC011363 on the 15 January 2001. These applications sought to replace CRC916173 A & B, CRC916228 A & B, CRC916230A & B, CRC916235 A & B, CRC916238 A & B, CRC916239 A & B, CRC916240, CRC916236 A & B and CRC916062 A & B. This application seeks the ability to:
  - To divert water from Little Omarama Stream into an irrigation race at a maximum rate of 170L/s. Once in this race the water is dammed in a header pond which holds approximately 45,000m<sup>3</sup>. The applicant then takes water from this header pond at maximum rate of 170L/s and uses it for the border dyke irrigation of up to 30 ha of land. This is shown in Red on the plan contained in Appendix A.
  - The applicant also discharges excess irrigation water from this area into the Omarama Stream. The point of discharge is shown as a Red Star on the plan contained in Appendix A. I note that this discharge was applied for, however, was not notified in 2007. I am unable to find on our files any reasons for this. Further, this discharge is required to enable the applicant to irrigate their land.
  - To divert water from the Omarama Stream into an irrigation race at a maximum rate of 350L/s. Once in this race the water is dammed in a header pond which holds approximately 45,000m<sup>3</sup>. The applicant then takes water from this header pond at a maximum rate of 350L/s for the border dyke irrigation of up to 115 ha of land. This is shown in Blue on the plan contained in Appendix A.
  - The applicant also discharges excess irrigation water from this area into the Omarama Stream. The point of discharge is shown as a Blue Start on the plan contained in Appendix A. Once again this discharge was applied for but not notified in 2007. As above, this application is needed to allow the applicants to irrigate their land.
  - To divert water from the Omarama Stream into an irrigation race at a maximum rate of 290L/s and to divert water from Middle Gully into an irrigation race at a maximum rate of 150L/s. Water is then taken and used from the irrigation races, sourced from both the Omarama Stream and Middle Gully, at a maximum rate of 350L/s for the border dyke and wild flood irrigation of 170 ha of land. This is shown in yellow on the plan contained in Appendix A.

- The applicant also discharges excess irrigation water from the border dyke irrigation is area into the Omarama Stream. The point of discharge is shown as a yellow star on the plan contained in Appendix A. Again this discharge was applied for but not notified in 2007. As above, this application is needed to allow the applicants to irrigate their land.
  - To divert, take and use water from Twaddles Creek at a maximum rate of 100L/s for the border dyke irrigation of 15 ha of land. This is shown in Orange on the plan contained in Appendix A;
  - The applicant also discharges excess irrigation water from the wild flood irrigation area and small border dyke irrigation area into Twaddle Creek. The point of discharge is shown in Orange on the plan contained in Appendix A.
  - To divert, take and use water from Twaddles Creek at a maximum rate of 45L/s for the border dyke irrigation of 12 ha of land. This is shown in pink on the plan contained in Appendix A.
  - To take and use water from the Little Omarama Stream at a maximum rate of 30L/s for stock and domestic water on Twinburn Station. This is shown as a black star on the plan contained in Appendix A.
  - To divert, take, use water from an irrigation race, and then discharge this water into the Omarama Stream at a maximum rate of 115L/s for micro hydro.
2. The applicant also wishes to be able to disturb the bed and bank of the Little Omarama Stream, Omarama Stream, Twaddles Creek and Middle Gully to maintain the existing intake structures and to facilitate the diversion of water.
  3. I note that Ms Rodrigo (paragraph 64 of Report 11A) states that the applicant previously held a consent to divert and discharge water into Twaddles Creek for the purpose of supplementing flows in the Omarama Stream as the flows in the mid to lower reaches of the Omarama Stream are to a certain extent reliant upon the water levels contained within the Clifton Downs (Omrama) Swamp i.e. if the water levels within the swap are low, then the flows in the mid reaches of the Omarama Stream tend to be low and visa versa. Ms Rodrigo then goes on to state that this application does not appear to replace this consent and this aspect should be addressed at the hearing. Additionally, Ms Rodrigo indicates that any augmentation of flows would require additional consents to be gained.
  4. In my opinion, the way in which this application was notified, in that the diversions from the various streams were separated out from the take and use component, could allow for the renewal of the augmentation of the flows into Twaddles Creek, thereby, augmenting the water levels within the Clifton Downs Swamp.

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

Timeline	CRC011361	CRC011362	CRC011363
Date of Lodging	15 January 2001	15 January 2001	15 January 2001
Notifiable Date	19 July 2002	19 July 2002	19 July 2002
Public Notification	4 August 2007	4 August 2007	4 August 2007

5. As set out above the applications to divert, take, se and discharge of water applied for in January 2001. Between February 2001 and November 2008 the CRC made a number of requests for further information. The applicant provided further information on the following matters:
  - Providing an alterative minimum flows for the Little Omarama Stream, the Omarama Stream, Middle Gully and Twaddle Creek;
  - An annual volumes for the proposed takes;
  - An assessment of the use of water on the water quality within the Mackenzie Basin;
  - An assessment of irrigation on landscape values within the Mackenzie Basin;
  - Whether additional consents are required for stockwater;
  - Providing derogation approval from Meridian Energy Ltd.

## 1.2 Water Source

6. The proposed takes are from the upper reaches of the Omarama Stream catchment. While there is very little information on the aquatic values associated with these smaller tributary streams, it is noted that the lower reaches of the Omarama Stream (i.e. that below the Clifton Downs bridge) is recognised as an important stream for fish species especially brown trout, which use the stream for spawning. Young (1987)<sup>1</sup> has stated that the Omarama Stream is one of the most important tributaries of the Ahuriri where spawning occurs. This report goes on to state that the Omarama Stream supports a moderately diverse community of invertebrates in high density. A search of ECan's GIS Database indicates that brown trout, long finned eels and Brook Char, have been found in Omarama Stream. Omarama Stream is a tributary of the Ahuriri River.

## 2 BACKGROUND INFORMATION

### 2.1 Farm Details

7. The applicant operates three stations being Twin Burn Station, Dunstan Peaks Station and Clifton Downs Station being a total area of 5,736 ha. Currently these properties are a mixture of free hold and leasehold land. The three stations are located on western side of Broken Hut Road for approximately 3 km, and from there on in the property is located on both sides of Broken Hut Road. The property is bounded to the east by the Ewe Range, to the south by the Hawkdun Range and to the west by the Wether Range.
8. The renewal of these applications is a very important and integral part of the overall farm management which is mainly fine wool and lamb finishing operation however, there is a limited amount of deer also grazed on the property. The irrigated paddocks are used primarily to provide high quality feed for lambs once they have been weaned allowing the applicant to grow the lambs out to prime weights. Further the irrigated areas are used to provide some assurance that they will be able to grow sufficient high quality winter feed for their stock.

### 2.2 McKenzie Irrigation Company Shares held

Name: Dunstan Peaks Ltd	Number
Property Shares	1
Irrigation Shares	0

9. The above applications are considered to be a renewal of existing activities, and as such MIC shares are not required.

### 2.3 Derogation Approval

10. Derogation approval was obtained in standard format from Meridian Energy Limited on 4 August 2009.

## 3 COMMENTS ON SUBMISSIONS

11. These applications were notified in 2003, as part of the "ministerial call-in". These applications were notified again in 2007. A summary of the 2007 submissions is as follows

Resource Consent	Submissions in support	Submission in opposition	Neutral
CRC012290	2	11	2

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<sup>1</sup> J R Young (1987) Omarama Stream Water Resource Inventory, Prepared for the Waitaki Catchment Commission and Regional Water Board.

CRC012291	2	12	2
CRC082211	2	12	2

12. 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.
13. Details of the submissions received that are not common to all applications are as follows

Submitter	Issues	Support/ neutral/ oppose
LINZ	The submitter has highlighted that some of the areas to be irrigated are subject to Crown Pastoral Lease. To enable the irrigation to occur the terms of the lease may need to be changed.	Neutral
Meridian Energy Ltd	The effects on water quality and flow metering requirements.	Oppose
Central South Island Fish and Game Council	The submitter is concerned that the renewal of these applications will have a negative impact upon the flows in the lower reaches of the Omarama Stream and therefore the Water Conservation Order.	Oppose

14. With respect to the LINZ submission, the applicant notes that the area has been irrigated for sometime (at least since the 1970's) and as such all the necessary has been irrigated for sometime (at least since the 1970's) and as such all the necessary permits have been in place for some time.
15. As outlined above, Meridian Energy Ltd have provided derogation approval and due to the fact that the application is a renewal of an existing permit. Further the applicant is proposing that the take be metered in accordance with the WCWARP. With respect whether the take will impact upon water quality, this aspect is addressed in section 4.4 of this evidence.
16. With respect to F & G's submission, these applications are renewal of existing applications and the application is proposing an minimum flow which is consistent with the Ahuriri Water Conservation Order.

## 4 CRC011361– TO TAKE AND USE WATER - ASSESSMENT OF ENVIRONMENTAL EFFECTS

### 4.1 Effects on other water users

Effects on other water users	
<b>Comments</b>	<p>This application is a renewal. No increase in rate or weekly volume (as currently authorised) is being sought.</p> <p>The CRC reporting officer for these applications agrees that effects on other users are minor provided appropriate flow sharing regime can be determined. Also issues around diversion into the Clifton Downs swamp need to be clarified.</p>

17. This application seeks the ability to divert, take and use water from a number of streams, all of which are tributary streams of the lower Omarama Stream. There are no other surface water abstractors either up or downstream of the proposed points of take from either Twaddle Creek or Middle Gully, due to the fact that the land through which these streams flow (from their source to the confluence with

Omarama Stream & Clifton Downs Swamp) is controlled by the applicant. There is an existing user (CRC960328 – Mr & Mrs Croft) located downstream of the take on the Little Omarama Stream. Ms Rodrigo notes the applicant gained the written approval of Mr & Mrs Croft in 2002. However, Ms Rodrigo appears to be unsure as to whether this approval is still valid. It should be noted that Mr & Mrs Croft are still owners/occupiers of Berwen Station and that this written approval has not been withdrawn, nor have they submitted on the application. Given this, it is my opinion that the written approval is still valid and as such the effects of the proposed activity on this user should not be taken into account when determining this application (pursuant to S 104 (2) of the RMA).

18. I also understand that there are a number of water permit holders, other than Mr & Mrs Croft, with the Omarama Stream catchment. The majority of these water permit holders are located within the area subject to the Ahuriri River Water Conservation Order (AWCO) and as such are subject to specific minimum flows and allocation regimes set out within the AWCO. Of particular relevance to this application is the fact that the “protected waters”, as defined by the AWCO, for the Omarama Stream does not extend past the Twin Peaks Station Bridge. This point is located downstream of these proposed takes. This means that the applications subject to this hearing are located outside the area controlled by the minimum flow and allocation regimes set by the AWCO.
19. However, even though these takes are located outside the area controlled by the AWCO, it is possible that the taking of water from these streams could impact upon the flows in the lower Omarama Stream thereby impacting upon the water permit who are located within the mid to lower reaches of the Omarama Stream and/or who’s consents are subject to the AWCO minimum flows. To ensure that this does not occur, the applicant is proposing to adhere to the Omarama Stream minimum flow as set out within the AWCO along with being a part of the water users group which is established on the Omarama Stream and operates a flow sharing regime during periods of low flows. I note that this is consistent with two existing users who, like the applicant, are located outside the area defined as “protected waters” but subject to the minimum flow regimes as set out within the AWCO.
20. As outlined by Mr de Joux there are a number of issues with setting minimum flows for this application. Rule 2, Table 3 (xxii) of the WCWARP requires that a minimum flow site is located at the bottom of the catchment. As there is an existing permanent flow recorder located at Tara Hills it would seem appropriate for this site to the site where minimum flows are monitored.
21. A 5 year, 7 day low flow for this site (Tara Hills) has been estimated at 470L/s. However, as set out within both Mr de Joux’s and Mr Stewart’s evidence, they have very little confidence that this flow (the 470L/s) accurately reflects the 5 year, 7 day low flow. Given the lack of confidence, both Mr de Joux and Mr Stewart recommend that in this particular situation the AWCO minimum flow would be appropriate. This minimum flow regime would require the applicant to cease taking water whenever the flow:
  - At the Tara Hills water level recorder reaches 250 L/s during November to April and 750L/s the remaining parts of the year; and
  - At the Omarama Station Bridge reaches 500L/ during November to April and 1,200L/s the remaining parts of the year.
22. Further, I note that the CRC’s current “standard” Omarama Stream minimum flow condition (as set out within Ms Penman’s 2A report) also requires all takes subject to the Omarama Stream Minimum flow to reduce the rate of take/daily volume by half whenever the flow reaches 800L/s. Further this condition also provides for the establishment of a water users group which operates to ensure the flow in the Omarama Stream remains above 500L/s as measured at the Omarama Station Bridge. When this water users group is activated, it is considered that the taking of water complies with the minimum flows.
23. I note that Ms Rodrigo and Mr Stewart agree that the AWCO minimum flow, for this application, would be appropriate. Further both Ms Rodrigo and Mr Stewart make comment that the applicant have held consents to divert water from the Omarama Stream and discharge this water into Twaddles Creek. The purpose of these consents is to augment the flows in the lower reaches of the Omarama Stream. Both Ms Rodrigo and Mr Stewart indicate that retaining this augmentation of flows is important to maintaining the existing permit holder’s reliability of supply. Therefore, it would appear important for this augmentation to be maintained.
24. However, Mr Stewart and Ms Rodrigo then go on to recommend an additional minimum flow of 160L/s be attached to this consent. This flow is to be measured upstream of the upper most Dunstan Peaks intake on the Omarama Stream. Unfortunately, neither Mr Stewart nor Ms Rodrigo provide any rational as to why the additional minimum flow is required. Further it appears that Ms Penman (Report 2A, paragraph 110) is recommending an yet another alternative minimum flow condition. In particular that

the applicant cease taking whenever the flow in the Omarama Stream are 900L/s between Nov – Apr and 916 for the remainder of the year. The rationale provided by Ms Penman is to ensure that existing permit holders are protected.

25. In terms of whether such additional minimum flows (other than the Omarama Stream AWCO minimum flow) would protect other permit holders the imposition of such a condition is not justified for the following reasons:
- There are no other permit holders on either Twaddles Creek or Middle Creek.
  - There is one other permit holder located on the Little Omarama Stream, (just downstream of the applicant's current intake). The applicant has gained the written approval of this user and as such the effects on this user are no longer considered.
  - There are no other surface water permit holders, who take from the Omarama Stream between the applicant's point of take (one marked in yellow on the maps contained in Appendix A) and where the Omarama Stream emerges from the Clifton Downs Swamp. This could be as a result of this reach of the stream (especially the reach below the Twin Burn Downs Bridge) going subsurface which makes this reach of the river unreliable as a water source. Photos of this occurring on 1<sup>st</sup> July 2009 when no irrigation was occurring are contained in Appendix B. It should also be noted that on the 16 May 2009 the stream experienced a large flood event. However, approximately 7 weeks later the same stream contained no surface flow in its mid reaches.
  - The proposed conditions would elevate the degree of protection for the downstream users by requiring the applicant to cease taking well before any other user within the Omarama Stream Catchment.
  - As a renewal consent the principle of non derogation from others rights does not apply – to do so would severely disadvantage the first renewal since they would effectively be required to cut off to safeguard the takes of other irrigators not in the same renewal sequence;
26. It should be noted that this application is to replace a number of existing water permits that have been in existence for a number of years. I appreciate that there is no automatic right of renewal. However the takes have occurred unfettered for some time and as such has shaped these downstream users' reliability of supply. Therefore, granting the proposed application could result in existing users' reliability of supply increasing rather than decreasing. This is because, the applicant is going to use the water available to them more efficiently than has occurred in the past, further they will be subject to minimum flows, which they haven't been subject to in the past. These efficient measures along with allowing the applicant to augment the flows in the Clifton Downs swamp will ensure that existing users' reality of supply is maintained, if not improved.
27. These proposed take sits within the area 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 m<sup>3</sup>/year for this area. Ms Bartlett's in her *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 of 275 million cubic meters per year being exceeded.
28. The applicant has gained derogation approval from Meridian Energy Ltd and as such the granting of the proposed takes will not impact upon its existing consents to take and use water within the catchment for power generation.

## 4.2 Effects on instream values

Minimum flow requirements	
Proposed Environmental Flow Regime	All other rivers and streams
<b>Comments</b>	<p>A minimum flow of 250 L/s measured at the Tara Hills recorder site and a flow of 500L/s measured at the Omarama Station Bridge is proposed during 1 Nov to 30 April.</p> <p>A minimum flow of 750 L/s measured at the Tara Hills recorder site and a flow of 1,200L/s measured at the Omarama Station Bridge is proposed during 1 May to 30 Oct.</p> <p>To half the daily volume whenever the flow in the stream, measured at the Omarama Station Bridge, reaches 800L/s.</p> <p>A water users group which allows the users to maintains a flow of at least 500L/s in the Omarama Stream, at the Omarama Station bridge, the take is considered to be in compliance with the minimum flows outlined above.</p> <p>The CRC reporting officer considers effects on fisheries values may be more than minor without appropriate fish screens in place.</p>

29. Table 3 of the WCWARP does not set a specific minimum flow regime for either the Little Omarama Stream, the Omarama Stream, Middle Gully and Twaddle Creek. Rather it provides a formula by which the applicant is able to determine an appropriate minimum flow. This formula requires the minimum flow to be the 5-year 7-day low flow and should be set at the downstream end of the catchment.
30. As outlined in Mr de Joux evidence and confirmed by Mr Dave Stewart (Ecan Hydrologist), a 5-year 7-day low flow for the Omarama Stream of 160L/s at Dunstan Peaks and of 470L/s at Tara Hills has been calculated. Further as has been outlined by Mr de Joux and Mr Stewart, they have no confidence that the 470L/s 5 year 7 day low flow is correct and as such neither are recommending this flow be adopted. Rather, as outlined in Section 4.1 above both are recommending that the Omarama Stream AWCO minimum flow.
31. As discussed at length in the section above, the proposed abstraction are located outside the area controlled by the AWCO. However, in saying this, I believe that it would be inappropriate to dismiss the values that are being protected by the AWCO as the values the AWCO aim to protect are echoed in the objectives and policies of the WCWARP, as values to be protected when determining minimum flow regimes. In this situation it appears to be a case where two statutory documents, which are tying to achieve the same outcomes, are not as integrated as would be desirable.
32. The AWCO aim to ensure that the "...*outstanding wildlife habitat, outstanding fisheries, and outstanding angling features*"<sup>2</sup> of the Ahuriri River and its tributaries which includes the Omarama Stream. Policies 2 – 5 of the WCWARP sets out the matters to be protected by minimum flow and allocation regimes. Of particular interest is Policy 4 which amongst other things aims to ensure that minimum flow regimes protect amongst other things habitat of fish and birds, recreational opportunities and existing flow and level regimes and physical resources and activities.
33. Table 3 of the WCWARP indicates that minimum flows should be set at the downstream end of the catchment. In this situation, there is an existing minimum flow recorded located at Tara Hills, so it would seem logical for any minimum flow to be measured at this point. However, at this point there is an existing minimum flow regime which has been set to ensure that the taking of water for irrigation is done in a manner which protects the instream values of the Omarama Stream.
34. Unfortunately the WCWARP is silent on specific policies for the Ahuriri Catchment. In the explanation (page 42 of the WCWARP) it is stated that there are no specific policies for this catchment as the AWCO sets the allocation limits and minimum flows for the taking, using, damming and diverting of water. The explanation states that the Quail Burn is the exception as it is specifically excluded from the Order and as such is addressed by Policy 40 of the WCWARP. Given this adhering to the AWCO

<sup>2</sup> Clause 3 Ahuriri Water Conservation Order

would ensure that the instream values of the mid to lower reaches of the Omarama Stream are protected.

35. the issues therefore appears to be whether the 160L/s, measured at Dunstan Peaks, as proposed by Mr Stewart and Ms Rodrigo protects the instream values in the upper reaches of the Omarama Stream and its tributaries. In this particular situation, there is an additional complication in that the Omarama Stream, between Waldrons Road Bridge and the Clifton Downs Bridge goes subsurface for a stretch of some 6 km. The effect of the upstream abstractions on the frequency and extent to which the stream fails to flow is unknown. However, it is known that this reach does go dry naturally. During a site visit on the 1 June 2009 I took the photos contained in Appendix B which show the stream flowing at the Twin Burn Bridge, but not at the Clifton Downs Bridge. As this was the middle of winter irrigation was not occurring at the time.
36. Further, the photo graphs (see Appendix B) are backed up by antidotal evidence outlined in Mr de Joux and Mr Stewarts evidence which indicate that this reach of the river will go dry regardless of any upstream abstractions.
37. Given this, along with the fact that the minimum flows set out within the AWCO aim to ensure that the aquatic habitat of the Omarama Stream are protected, which is consistent with the objectives and policies of the WCWARP, imposing the AWCO minimum flow should ensure that the proposed takes do not have a more than minor effect on the aquatic ecosystem.
38. When water is taken either directly from a waterbody without an appropriate fish screen in place, there is the potential for the aquatic values of that waterway to be adversely affected. With respect to this application, there are existing intake structures on all the streams. Currently there are no fish screens in place upon either the point at which water is diverted from the stream or where irrigation water is taken from the diversion race or header pond. The applicant is proposing a mitigation measure which will determine whether a fish screen is required and that if a screen is required one will be designed, installed and certified to ensure that any necessary screens as is practicable excludes fish and are in general accordance with the report *Fish Screening: good practice guidelines for Canterbury, NIWA Client Report: CHC2007.092, October 2007.*

### 4.3 Effects of inefficient water use

#### 4.3.1 Twin Burn – Little Omarama Stream

Reasonable and Efficient Use Seasonal Volumes and Land Use	
Land Use	Mixed (cropping, and pasture for fattening sheep and beef cattle)
Area to be irrigated (hectares)	30 ha
Method of application	Border Dyke
Daily application depth	7.7 mm
Return period	10 days
Application depth	77 mm
Soil profile available water	< 75 mm
Effective Irrigation Season Rainfall	190 mm
Seasonal volume required (m <sup>3</sup> /year)	180,000 m <sup>3</sup> /year
Seasonal volume Schedule WQN9v2 (m <sup>3</sup> /year)	187,500 m <sup>3</sup> /year
Volume to be included in Table 5 (WCWARP) allocation	180,000 m <sup>3</sup> /year

<b>Comments</b>	The proposed annual volume is based upon applying 600 mm/ha/year or 6,000m <sup>3</sup> /year. Schedule WQN9v2 is 187,500 m <sup>3</sup> /year which is less than the proposed annual volume.
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#### 4.3.2 Twin Burn – Omaram Stream

<b>Reasonable and Efficient Use Seasonal Volumes and Land Us</b>	
<b>Land Use</b>	Mixed (cropping, and pasture for fattening sheep and beef cattle)
<b>Area to be irrigated (hectares)</b>	115 ha
<b>Method of application</b>	Border Dyke
<b>Daily application depth</b>	7.7 mm
<b>Return period</b>	10 days
<b>Application depth</b>	77 mm
<b>Soil profile available water</b>	< 75 mm
<b>Effective Irrigation Season Rainfall</b>	190 mm
<b>Seasonal volume required (m<sup>3</sup>/year)</b>	690,000 m <sup>3</sup> /year
<b>Seasonal volume Schedule WQN9v2 (m<sup>3</sup>/year)</b>	718,750 m <sup>3</sup> /year
<b>Volume to be included in Table 5 (WCWARP) allocation</b>	690,000 m <sup>3</sup> /year
<b>Comments</b>	The proposed annual volume is based upon applying 600 mm/ha/year or 6,000m <sup>3</sup> /year. Schedule WQN9v2 is 718,750 m <sup>3</sup> /year which is more than the proposed annual volume.

#### 4.3.3 Dunstan Peaks – Omaram Stream & Middle Gully

<b>Reasonable and Efficient Use Seasonal Volumes and Land Use</b>	
<b>Land Use</b>	Mixed (cropping, and pasture for fattening sheep and beef cattle)
<b>Area to be irrigated (hectares)</b>	170 ha
<b>Method of application</b>	Border dyke & Wild flood moving towards spray
<b>Daily application depth</b>	6 mm
<b>Return period</b>	14 days

<b>Application depth</b>	84.6 mm
<b>Soil profile available water</b>	< 75 mm
<b>Effective Irrigation Season Rainfall</b>	190 mm
<b>Seasonal volume required (m<sup>3</sup>/year)</b>	1,020,000 m <sup>3</sup> /year
<b>Seasonal volume Schedule WQN9v2 (m<sup>3</sup>/year)</b>	1,079,500 m <sup>3</sup> /year
<b>Volume to be included in Table 5 (WCWARP) allocation</b>	1,020,000 m <sup>3</sup> /year
<b>Comments</b>	The proposed annual volume is based upon applying 600 mm/ha/year or 6,000m <sup>3</sup> /year. Schedule WQN9v2 is 1,079,500 m <sup>3</sup> /year which is more than the proposed annual volume.

#### 4.3.4 Dunstan Peaks – Twaddle Creek

<b>Reasonable and Efficient Use Seasonal Volumes and Land Use</b>	
<b>Land Use</b>	Mixed (cropping, and pasture for fattening sheep and beef cattle)
<b>Area to be irrigated (hectares)</b>	15 ha
<b>Method of application</b>	Border Dyke
<b>Daily application depth</b>	6.8 mm
<b>Return period</b>	10 days
<b>Application depth</b>	68 mm
<b>Soil profile available water</b>	< 75 mm
<b>Effective Irrigation Season Rainfall</b>	180 mm
<b>Seasonal volume required (m<sup>3</sup>/year)</b>	90,000 m <sup>3</sup> /year
<b>Seasonal volume Schedule WQN9v2 (m<sup>3</sup>/year)</b>	95,250 m <sup>3</sup> /year
<b>Volume to be included in Table 5 (WCWARP) allocation</b>	90,000 m <sup>3</sup> /year
<b>Comments</b>	The proposed annual volume is based upon applying 600 mm/ha/year or 6,000m <sup>3</sup> /year. Schedule WQN9v2 is 95,250 m <sup>3</sup> /year which is less than the proposed annual volume.

#### 4.3.5 Clifton Downs – Twaddles Creek

Reasonable and Efficient Use Seasonal Volumes and Land Use	
Land Use	Mixed (cropping, and pasture for fattening sheep and beef cattle)
Area to be irrigated (hectares)	12 ha
Method of application	Border Dyke
Daily application depth	3.8 mm
Return period	10 days
Application depth	38 mm
Soil profile available water	<75 mm
Effective Irrigation Season Rainfall	180 mm
Seasonal volume required (m <sup>3</sup> /year)	72,000 m <sup>3</sup> /year
Seasonal volume Schedule WQN9v2 (m <sup>3</sup> /year)	76,800 m <sup>3</sup> /year
Volume to be included in Table 5 (WCWARP) allocation	72,000 m <sup>3</sup> /year
Comments	The proposed annual volume is based upon applying 600 mm/ha/year or 6,000m <sup>3</sup> /year. Schedule WQN9v2 is 76,800 m <sup>3</sup> /year which is less than the proposed annual volume.

39. Traditionally two methods have been used to determine whether the use of water for irrigation is efficient. The first method is ensuring that the peak application rate is no more than half the water holding capacity of the soil. The second method by through the implementation of an annual volume using one of the two methods set out in Policy 16 (c) of the WCWARP.
40. For the Twinburn applications the applicant currently is applying 77 mm (gross) per 10 days. However, border dyke irrigation methods can be between 40 –60 % efficient. Assuming the system is 60% efficient the applicant would be applying 31 mm/10 days. Once again this is still more than 50% the water holding capacity for the very light soils located on-site but is not more than 50% the water holding capacity of the “heaver” soils located on site.
41. For the Dunstan Peaks applications the applicant currently is applying between 84.6 and 68 mm (gross) per 10 days. However, border dyke irrigation methods can be between 40 –60% efficient, however, given that currently there is a portion of wild flood irrigation the efficiency of the method of irrigation, is likely to be at best 40% efficient for the border dyke and wild flooding area and 60% efficient for the pure border dyke irrigation. Given this efficiently I would anticipate that the applicant would be applying between 51 mm and 40 mm per 10 days. As with Twinburn’s applications this is still more than 50% the water holding capacity for the very light soils located on-site but is not more than 50% the water holding capacity of the “heaver” soils located on site.
42. With respect to the Clifton Downs takes the applicant proposes to apply 38 mm per 10 days which is less than 50% of the water holding capacity of the soil.
43. It should also be noted that if the applicant is proposing an annual volume based upon 600 mm/ha/year. If the applicant were to use their peak rate of take for 24 hours per day, for the Twinburn and Dunstan Peaks takes, the proposed annual volume would only allow them to take for a maximum of between 23 and 48 days per year. With respect to the border dyke methods of irrigation, in order for them to maximise the number of days they are able to irrigate, they may change the method of

irrigation from border dyke to spray. However, due to financial reasons this may not occur straight away.

44. With respect to the area of flood irrigation, the applicant is proposing to move away from this method of irrigation and implement a spray irrigation method. Due to financial reasons, this is unable to occur straight away, but is proposed to occur within a 5 year timeframe.
45. This application proposes annual volumes which is based upon the applicant applying up to 600 mm/ha/year. I note that using the methodology set out in Policy 16 (c) (ii) an annual volume of more than that proposed by the applicants would be acceptable. The latter annual volume is based upon mean rainfall of the area and the various soil types of the area.
46. When determining whether or not the proposed use of water is efficient I note that Policy 28 of the WCWARP states that the consent authority should take into account (a) whether the applicant has made reasonable attempts to meet the efficiently expected of the Plan and (b) the value of the investment made by the existing consent holder. In this particular situation, while the peak application rates may result in more water being applied that would be considered acceptable for a new irrigation system the are proposing annual volume which are less than that which is considered reasonable using the methodology set out within Policy 16 (c) (ii) of the WCWARP. Therefore, the applicant is making reasonable attempt to meet the efficiency expectations of the Plan.
47. Policy 21 of the WCWARP requires all water takes to be metered. To ensure that this application is consistent with this policy, the applicant proposes to meter their take.

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

<b>Water Quality</b>	
<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>

48. The MWRL Water Quality Study states that the areas to be irrigated are located within the Lake Aviemore and Lake Waitaki Catchments. This study goes on to calculate N and P thresholds for the property.
49. 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.
50. OVERSEER® has been run by 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.

	<b>Nitrogen Threshold (Kg/Farm)</b>	<b>Phosphorous Threshold (kg/Farm)</b>
MWRL Water Quality Study Property Thresholds	28,109	534
OVERSEER® outputs	15,032	380

51. The applicant is committed to implementing the “Mandatory Good Agricultural Practices” set out within the Farm Environmental Management Plan (FEMP) (see Appendix D). 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.
52. Whilst the applicant is able to comply with the thresholds outlined within the MWRL Water Quality Study, this study also 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 D).

53. 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.
54. 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.
55. For Dunstan Peaks Ltd, the desktop risk assessment identified the following potential risks:
  - The large number of surface water bodies that flow through the property;
  - Extensive tracking;
  - Use of full cultivation;
56. 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 (see Appendix D).
57. 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 values

<b>Effects on Landscape</b>	
<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 the effects on landscape are uncertain and may therefore be more than minor</p>

58. Submissions have been received which state that the Mackenzie Basin as a whole is considered to be an “outstanding natural landscape”. These values could be impacted upon through the irrigation of land. The area is located adjacent to Broken Hutt Road. This road is used primary to provide access to Twin Peaks, Clifton Downs, Dunstan Peaks and Twinburn Stations. The area is located the most some 12 km and the least some 5 km to the south of the Omarama Lindis Pass Road (SH 8).
59. Mr Andrew Craig will provide further evidence as to whether the irrigation of this area will impact upon the landscape values of the area and as such I do not propose to repeat his assessment here. Mr Craig has concluded that the general effects on the Mackenzie landscape of these applications will be significantly less than minor. Given this, the effects of the proposed takes on landscape values is considered to be minor.

#### 4.6 Effects on Tangata Whenua Values

<b>Effects on Tangata Whenua</b>	
<b>Comments</b>	<p>The CRC reporting officer for these applications considers the effects on landscape are uncertain and may therefore be more than minor</p>

60. Te Runanga O Ngai Tahu submitted on all applications in the catchment, seeking that all applications be declined. 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.

61. 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.

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

Effects on People, Communities and Amenity	
<b>Comments</b>	The CRC reporting officer for these applications considers there may be effects on people and communities may be more than minor.

62. The applicant has proposed an appropriate minimum flow condition for the water body from which they have applied to take and use water. A minimum flow is considered to adequately protect people, community and amenity values within the rivers specific to each applicant.
63. The activities all occur within a rural setting, where the dominant land use is pastoral farming. And, given that the proposed activities all occur on private farmland the use of water is unlikely to adversely affect amenity values.
64. The WCWARP sets an annual allocation "cap" for agricultural and horticultural activities within defined areas (Table 5). The applicant has proposed an annual allocation limit for their own resource consents for the use of water, as well as implementing Farm Management Plans, which require existing irrigation systems to be audited and improved where possible, and new systems to be designed and installed by accredited personnel, and implementing initiatives to ensure that water is used wisely.
65. The primary objective of an annual allocation is to ensure that the water is used efficiently and effectively for the land use, soil type and climatic conditions. The applicant has proposed an annual volume that is considered to reflect reasonable and actual use and this is within the allocation limit defined by Table 5.
66. Therefore, given the applicant's commitment to ensuring efficient use of water on their properties, and that the take is within allocation limits set to protect in-stream values and other users, it is considered that effects on people and communities will be minor.

## 5 CRC011361 – TO DAM WATER - ASSESSMENT OF ENVIRONMENTAL EFFECTS

### 5.1 Effects of Dam Failure on Surrounding Properties

67. This application seeks the ability to dam up to 45,000m<sup>3</sup> in each of two existing header ponds. These two ponds have been in place since 1982 (some 27 years) and are used to store water prior to using it for the irrigation of land via a border dyke irrigation scheme. This application does not seek the ability to dam either the Little Omarama Stream or the Omarama Stream as both of these ponds are located outside the beds to these waterways as shown on the plan contained in Appendix A.
68. To fill these two ponds, water is diverted from both Little Omarama Stream and the Omarama Stream into races used to fill these ponds. This means that the applicant has a high degree of control over how much water is stored within these ponds at any one time.
69. When a dam fails it can cause a wave of water to flow down gradient. This sudden appearance of moving water can mean that people downstream of the failed dam experience significant losses of property, stock, and even life. Also if the dam is located within a waterway, the ecosystem downstream of the dam can be significantly damaged. As set out above, in this particular situation both the ponds are not located within the bed of a waterway, and as such we have not assessed the possible ecological effects of dam failure.
70. Also these two ponds were constructed some time ago (at least 15 years ago). The dams themselves consist of earth walls that are no more than 3m in height with the faces of these ponds being grassed. Both of these ponds are located at the top of border dyke irrigation scheme that is owned and operated by the applicant.
71. I note that the pond filled from the Little Omarama Stream is located approximately 1.7 km upstream of the Twinburn homestead, with the pond being filled from the Omarama Stream being located approximately 2 km upstream of the same homestead. I note that between these ponds and the homestead are existing border dyke irrigation scheme which includes a number irrigation races that are used not only to convey irrigation water around the scheme but also used to collect any excess by-wash water so that where possible this water can be reused to irrigate additional areas of land.
72. I note that the fall of the land means that water flows in a northwesterly direction or parallel to the existing road which is an extension to Broken Hutt Road. The closest neighbouring property is located to the north of the existing road. As the pond that is filled from the Little Omarama Stream is located within a close proximity to this boundary, should this pond fail it could impact upon any dwelling or building located within a close proximity. I am unaware of any dwellings or building that are located on the neighbouring land, within a close proximity of this particular pond.
73. Another potential effect is that the dams could be over topped. This is of particular concern when such ponds are filled via sheet flow or overland flow within natural depressions that occur post heavy and/or prolonged rain events. In this particular situation the dams are not located within natural gullies and are filled using dedicated diversion races. This means that the applicant has a high degree of control over how much water is diverted into these dams. Given this, the risk of the proposed dams being overtopped due to over filling is considered to be minor.

## **6 CRC011363 – TO UNDERTAKE WORKS WITHIN THE BED OF VARIOUS STREAMS - ASSESSMENT OF ENVIRONMENTAL EFFECTS**

74. I note that Ms Rodrigo has stated that “...the applicant has not applied for, or included the structures or channels associated with the upper Omarama Stream...” (Paragraph 18 of Report 11 B). Ms Rodrigo then goes on to list the locations of the structures she considers to be part of this application. To determine I have gone back to the original notification wording which states “*To disturb the bed and banks at Little Omarama Stream to facilitate the taking of water and to carry out remedial works as required to maintain the diversion structure, at or about map references NZMS 260 H40:635-166, NZMS 260 H40:613-159 and NZMS 260 H40:615-177.*” I note that the first grid reference (H40:635-166) is the point at which water is diverted from the Little Omarama Stream. However, the second two grid references (H40:613-159 and H40:615-177) are the two points at which water is diverted from the Omarama Stream. Unfortunately the latter two grid references seem to be missing from Ms Rodrigo’s evidence without an explanation as to why she has not considered them.

### **6.1 Effects of the works on flood-carrying capacity and flooding patterns of the river**

75. This application seeks the ability to maintain existing intake and diversion structures within the beds of Little Omarama Stream, Omarama Stream, Middle Gully and Twaddle Creek. As has been previously stated, these intakes have been in place for a number of years, and this application simply seeks the ability to maintain them and facilitate the diversion of water to them.
76. The works required to facilitate the diversion of water into the intakes involves minor instream works to keep water flowing into the intake, the removal of flood debris including gravel from the bed of the river and diversion channel, rock armoring on the banks of the stream around the intake structures. As these streams are small mountain streams they are subject to high flows at specific times of the year (i.e. spring during snow melt). These streams also have a gravel bed which, at these times of year can be highly mobile. This means that prior to irrigating, the applicant may have to undertake the works outlined above to enable them to irrigate.
77. Works within the bed of these waterways could impact upon how the stream reacts during a flood event. In particular, where there are structures within the bed such as dams/weirs, there can reduce the floodwater carrying capacity of the waterway resulting in flooding of adjacent land. In this particular situation, the works simply aim to remove excess gravel build up and do not propose to install any weirs/dams etc within the beds of the waterways. Given this it is unlikely that the proposed works will reduce the flood carrying capacity of the waterway.

### **6.2 Effects of the works on water quality**

78. When works are undertaken within flowing water, the works may cause a temporary discoloration of the water. This discoloration is as a result of the water within the waterway containing higher than “normal” suspended sediments. Higher than normal suspended sediments can have a number of negative impacts upon the aquatic ecosystem of the waterway, such as “cementing” spawning gravels downstream of where the works are occurring, and also can have a negative physical impact upon fish (in that high levels of suspended solids can irreparably damage fish gills).
79. The most common approach is to avoid undertaking works within flowing water. Thereby avoiding the possibility of increasing levels of suspended sediment contained within the waterway. In this particular instance, it is simply not practicable for the construction of the bund to occur “in the dry” or outside the flowing water.
80. One way of mitigating the effects of undertaking works within the waterway, is to limit the amount of time the work is within the waterway. Further, measures, such as ensuring that the works occur outside spawning season (if the waterway is known as a spawning river) can ensure that the works do not have a significant impact upon the water quality and thereby the aquatic ecosystem. The measure proposed by the applicant to address this aspect is outlined in Appendix C.

### **6.3 Effects on bank erosion and stability**

81. When works occur in the bed of rivers, the incorrect placement of such structures can lead to bank erosion and decrease bank stability. This is due to the fact that structures can direct water towards a bank thereby increasing the erosion of that bank thereby meaning that the bank is less stable.

82. In this particular situation the purpose of the works is to facilitate the diversion of water into the intake structures and ensure that these structures are not undermined (or eroded). This means that it is in the applicants interest to actively monitor the bed and banks of the waterways to ensure that their structures are not causing erosion and if they are, or if erosion occurs that it is fixed as soon as is practicable. Further, these structures have been in place for a number of years (at least 40) without significantly increase the rate at which the bed and banks of the various waterways erode. Given this allowing the applicant to undertake the proposed works is unlikely to have more than a minor impact upon these waterways.

#### **6.4 Effects on other artificial structures**

83. When works occur in the beds of rivers within a close proximity of an exiting artificial structures, the proposed structure can have a negative impact upon the existing structure. I am unaware of any artificial structures, which are not either owned or maintained by the applicant within a 1.4 km radius of the existing structures. Given this, the placement of the weir with the bed of the various streams is considered to be minor.

## **7 CRC011362 – TO DISCHARGE WATER INTO WATER – ASSESSMENT OF ENVIRONMENTAL EFFECTS**

### **7.1 Effects of the discharge on water quality**

84. This application seeks the ability to discharge water into Omarama Stream and Twaddle Creek that have been taken from the various stream and used for the border dyke irrigation of crop and pasture. Further this application also seeks the ability to discharge water from the micro hydro plant.
85. In this situation the water being discharged into Twaddle Creek from the irrigation system, has travelled over the paddocks picking up contaminants, such as animal faeces, suspended sediments, and nutrients. Therefore, it is possible that the water quality of the water contained within the discharge could be degraded. The discharge of this degraded water into the receiving water (of a higher quality) could have a negative impact upon the aquatic ecosystem present in the waterway. Further Section 107 (1) of the Act requires discharges, after reasonable mixing must meet a number of water quality standards. These standards included, amongst other things “...*Any significant adverse effects on aquatic life...*” This aspect has been identified as an environmental farm risk and will be addressed as part of the environmental farm management plan which will ensure that the effects of the discharge after reasonable mixing are minor.

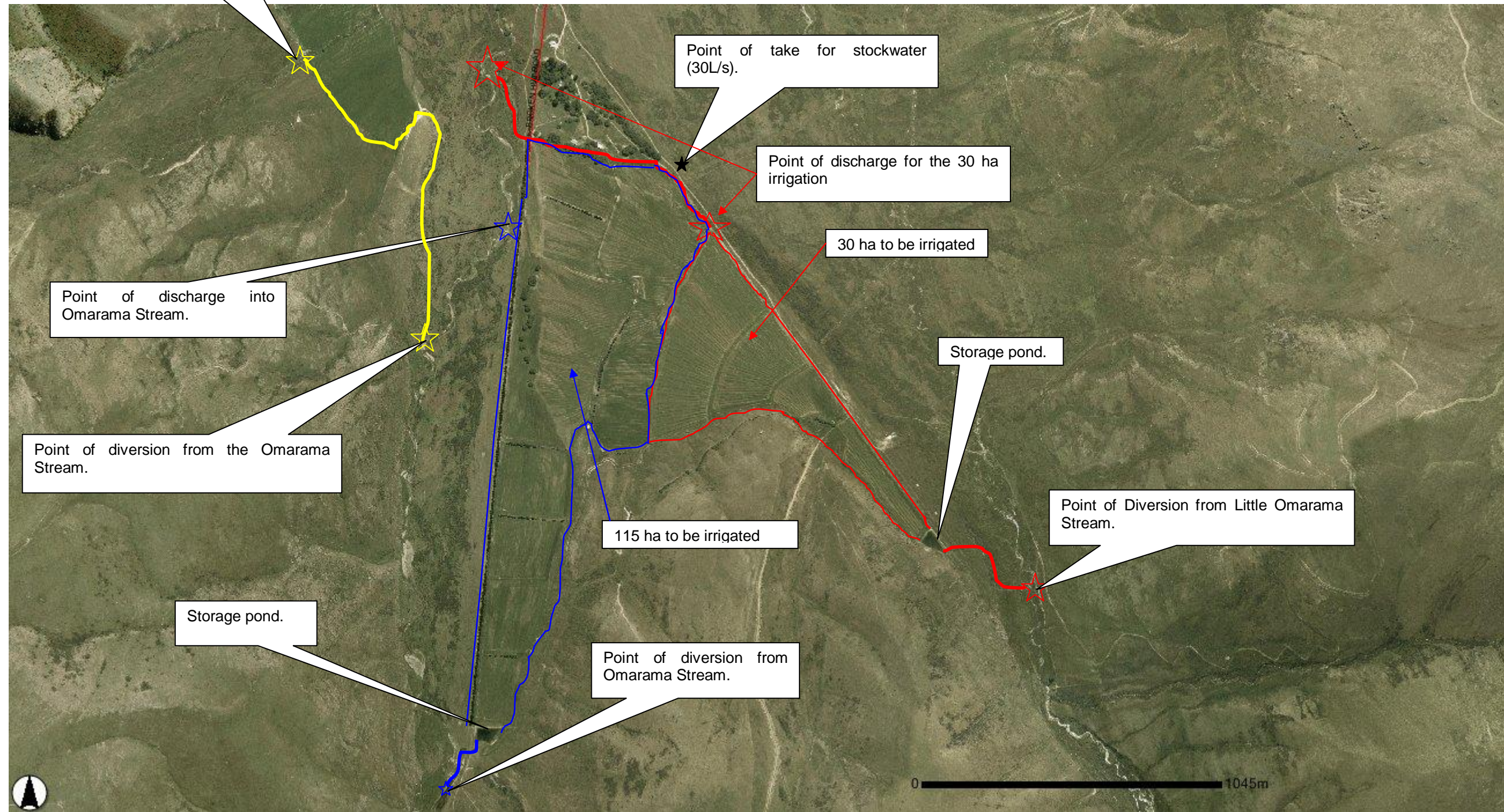
### **7.2 Effects of the discharge on other water users**

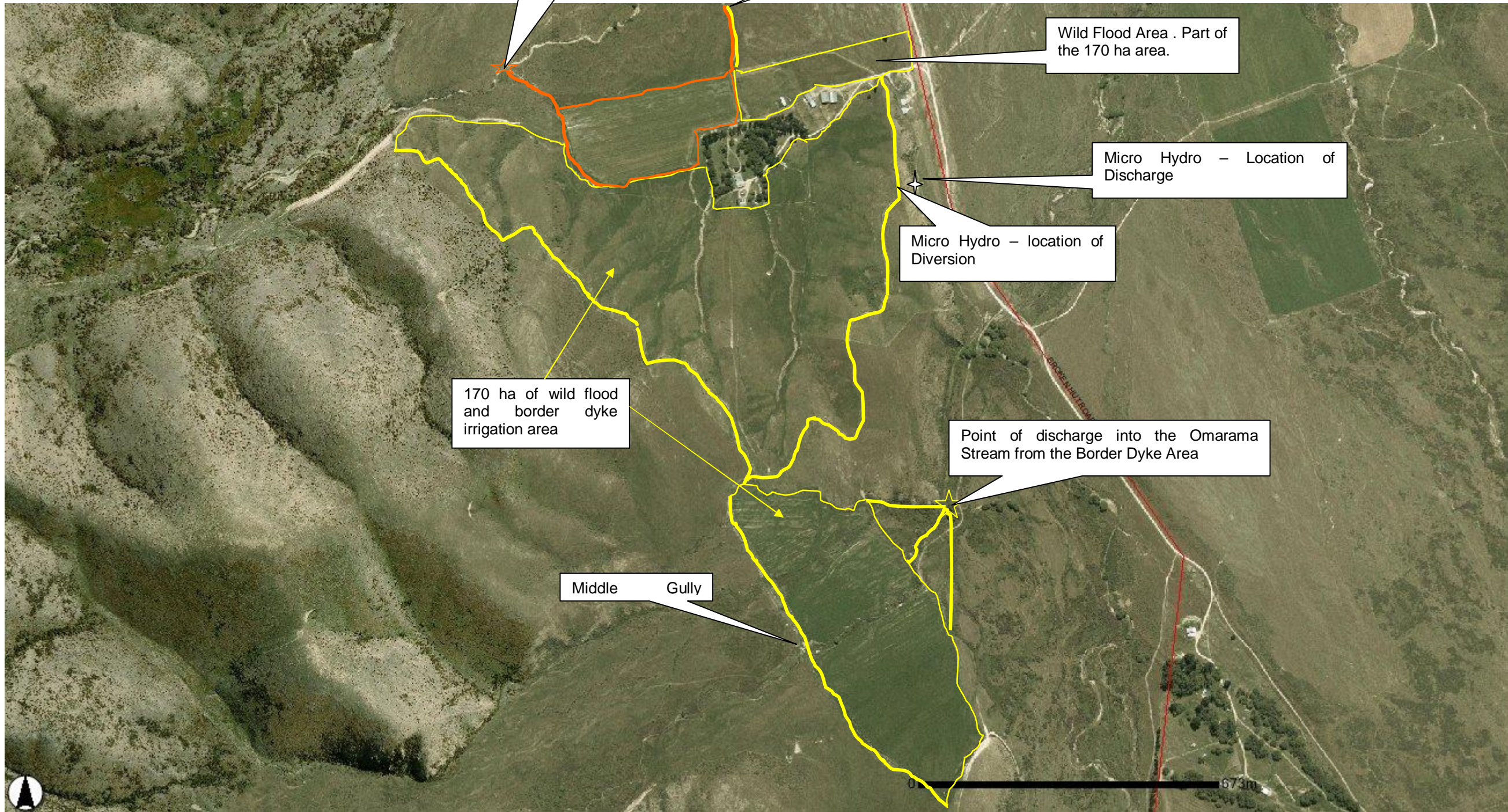
86. When water is discharged there is the potential to cause adverse effects on the recreational users of river/stream due to the contamination of the water. Contaminants such as suspended sediments (turbid water) affect recreational users because turbid water is aesthetically unappealing and unsuitable for bathing and other contact recreation.
87. Section 107 (1) of the Act requires discharges, after reasonable mixing meeting a number of water quality standards. These standards included, amongst other things do not allow discharges that results in “...*conspicuous oil or grease films, sums or foams or floatable or suspended materials...*” or “...*The rendering of fresh water unsuitable for consumption by farm animals...*”.
88. While there are a number of users downstream of the applicants discharge, the water contained within Twaddle Creek has to flow through the Clifton Downs swamp prior to entering the Omarama Stream. The Clifton Downs swamp tends to “clean” the water that flows through it, thereby ensuring that the water quality of the lower reaches of the Omarama Stream is maintained.

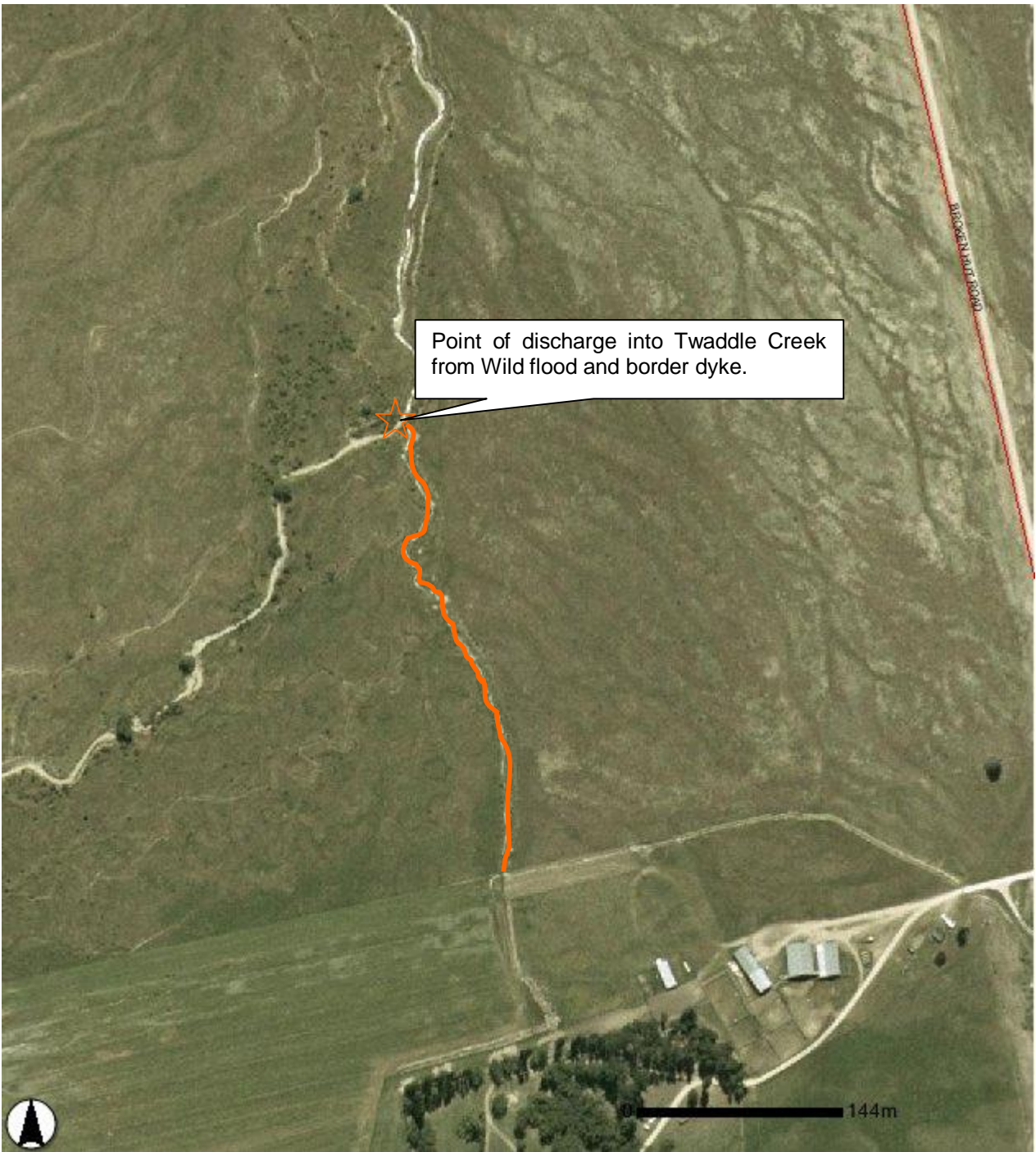
### **7.3 Effects of discharge of water on erosion of the bed and banks of the receiving waterbody**

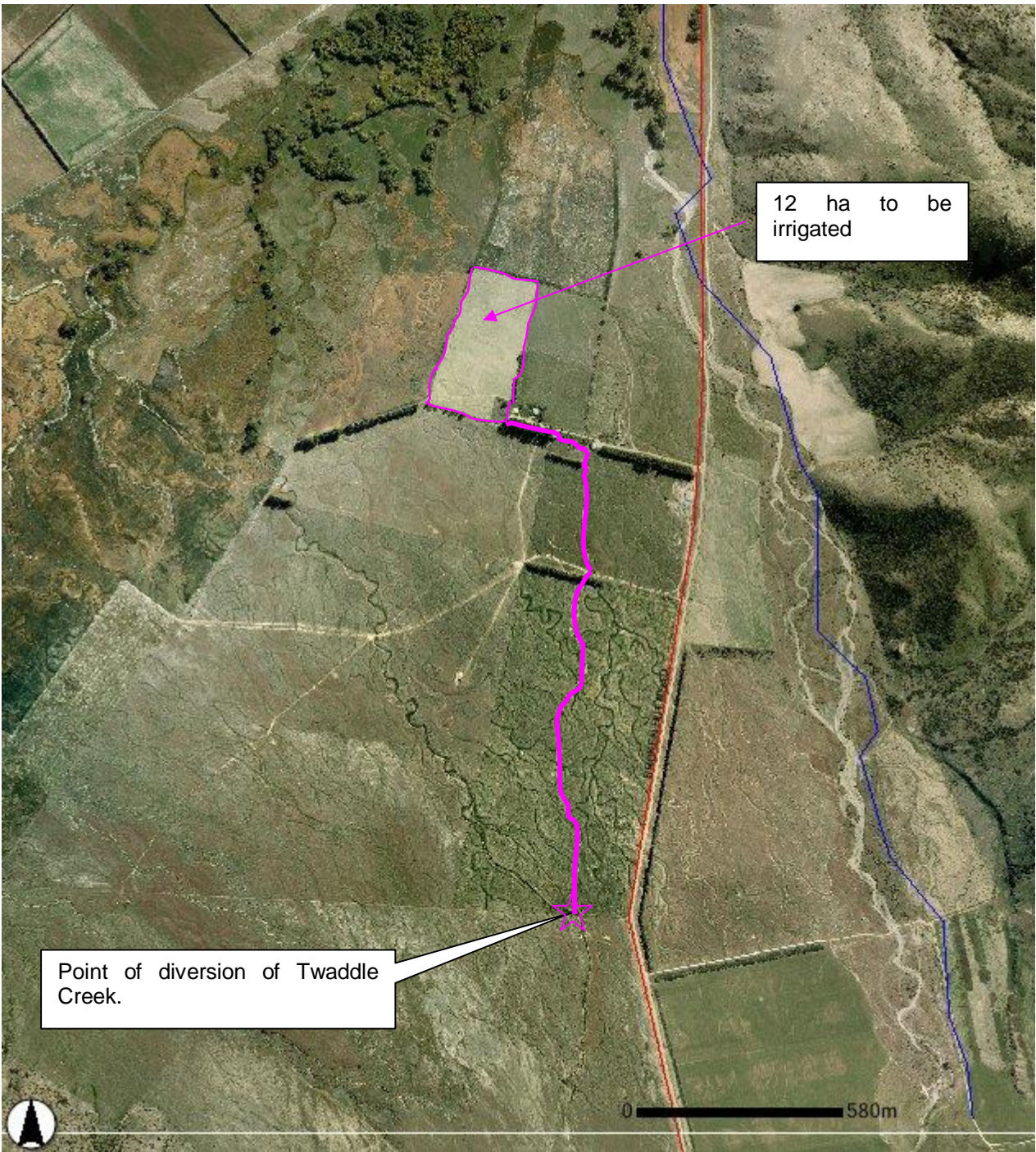
89. When water is discharged into a waterway, the flow, and potentially the velocity, of the receiving waterbody is increased, thereby increasing the rate at which the bed of the waterway is eroded. In this particular instance, the discharge from the various races, into the lower reaches of the Omarama Stream and Twaddles Creek has been undertaken for a number of years without the bed of these streams being eroded.

# APPENDIX A – RELEVANT PLANS









12 ha to be irrigated

Point of diversion of Twaddle Creek.

0 580m

# APPENDIX B - PHOTOS

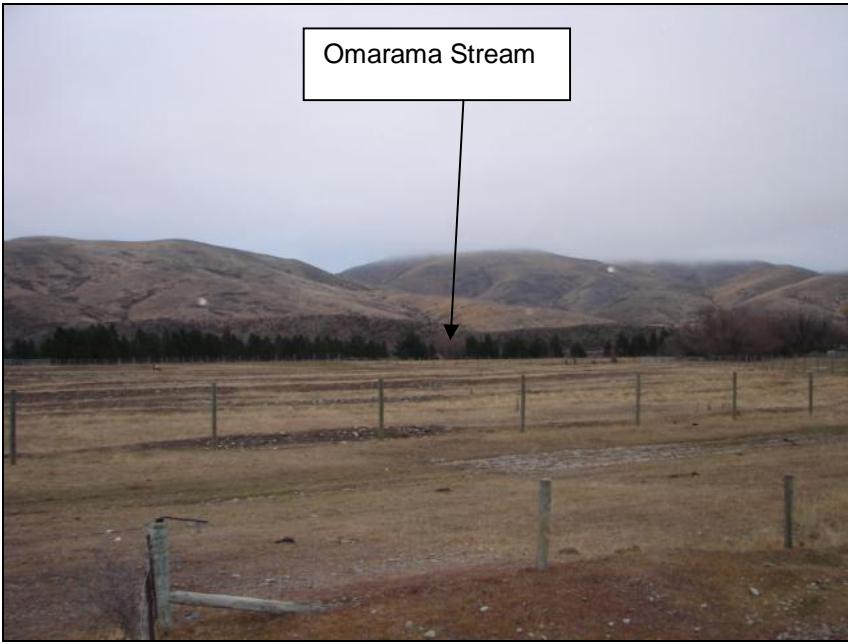
## Twinburn Station

Approximate location of dam feed by Little Omarama Stream



Approximate location of dam feed by Omarama Stream





**Dunstan Peaks**



Existing Border  
dyke irrigation



Wild flood Race  
used to irrigate  
this area





Wild flood race  
used to irrigate  
the area

**Photo taken 1 July 2009. Looking downstream from bridge over Omarama Stream at Twin Burn Station. As set out above, this stream was in full flood on the 16 May 2009.**



**Photo taken 1 July 2009. Looking upstream from bridge over the Omaram Stream at Cliton Downs.**



Photo taken 1 July 2009. Looking downstream from Twin Peaks Bridge



# APPENDIX C - PROPOSED CONDITIONS

## CRC011361 & CRC011362 – TO TAKE AND USE WATER

No.	Condition Code <sup>3</sup>	Details
<b>Take</b>		
1		<p>Water may only be diverted from Little Omarama Stream, at surface water abstraction point [XXX], at or about map reference [XXX].</p> <p>Water may only be taken from the storage pond and diversion channel associated with the diversion specified in Condition [XXX].</p> <p>Water may only be diverted from Omarama Stream, at surface water abstraction point [XXX], at or about map reference [XXX].</p> <p>Water may only be taken from the storage pond and diversion channel associated with the diversion specified in Condition [XXX].</p> <p>Water may only be diverted from Omarama Stream, at surface water abstraction point [XXX], at or about map reference [XXX].</p> <p>Water may only be diverted from Middle Gully, at surface water abstraction point [XXX], at or about map reference [XXX].</p> <p>Water may only be taken from the diversion channel associated with the diversion from the Omarama Stream and Middle Gully specified in Condition [XXX].</p> <p>Water may only be diverted from Twaddle Creek, at surface water abstraction point [XXX], at or about map reference [XXX].</p> <p>Water may only be taken from the storage pond and diversion channel associated with the diversion from Twaddle Creek specified in Condition [XXX].</p> <p>Water may only be diverted from Twaddle Creek, at surface water abstraction point [XXX], at or about map reference [XXX].</p> <p>Water may only be taken from the storage pond and diversion channel associated with the diversion from Twaddle Creek specified in Condition [XXX].</p>
2		<p>Water may be diverted from Little Omarama Stream at a rate not exceeding 170 litres per second, with a volume not exceeding 4,896 cubic metres per day.</p> <p>Water may be taken for irrigation purposes from the storage pond at a rate not exceeding 170 litres per second, with a volume not exceeding 4,896 cubic metres per day and 180,000 cubic metres between 1<sup>st</sup> July and the following 30<sup>th</sup> June.</p> <p>Water may be diverted from the Omarama Stream at a rate not exceeding 350 litres per second, with a volume not exceeding 18,900 cubic metres per day.</p> <p>Water may be taken for irrigation purposes from the storage pond at a rate not exceeding 350 litres per second, with a volume not exceeding 18,900 cubic metres per day and 690,000 cubic metres between 1<sup>st</sup> July and the following 30<sup>th</sup> June.</p> <p>Water may be taken from the Little Omarama Stream at a rate of 30 litres per second, with a volume not exceeding 2,592 cubic metres per day and 946,080 cubic meters between 1<sup>st</sup> July and the following 30<sup>th</sup> June.</p> <p>Water may be diverted from the Omarama Stream at a rate not exceeding 290 litres per second, with a volume not exceeding 11,185 cubic metres per day.</p> <p>Water may be diverted from Middle Gully at a rate not exceeding 150 litres per second, with a volume not exceeding 11,185 cubic metres per day</p> <p>Water may be taken for irrigation purposes from the irrigation races at a rate not exceeding 290 litres per second, with a volume not exceeding 11,185 cubic metres per day and 1,020,000 cubic metres between 1<sup>st</sup> July and the following 30<sup>th</sup> June.</p> <p>Water may be diverted from Twaddles Creek at a rate not exceeding 100 litres per second, with a volume not exceeding 8,640 cubic metres per day</p> <p>Water may be taken for irrigation purposes from the irrigation races at a rate not exceeding 100 litres per second, with a volume not exceeding 8,640 cubic metres per day and 90,000 cubic metres between 1<sup>st</sup> July and the following 30<sup>th</sup> June.</p> <p>Water may be diverted from Twaddles Creek at a rate not exceeding 45 litres per second,</p>

<sup>3</sup> See Report 1, Appendix 6 for condition code and explanation

		<p>with a volume not exceeding 3,888 cubic metres per day</p> <p>Water may be taken for irrigation purposes from the irrigation races at a rate not exceeding 45 litres per second, with a volume not exceeding 3,888 cubic metres per day and 72,000 cubic metres between 1<sup>st</sup> July and the following 30<sup>th</sup> June.</p> <p>Water may be diverted from an irrigation race at a rate not exceeding 115 litres per second, with a volume not exceeding 69,552 cubic metres per day</p> <p>Water may be taken for micro hydro purposes from the irrigation races at a rate not exceeding 115 litres per second, with a volume not exceeding 69,552 cubic metres per 7 days and 3,616,704 cubic metres between 1<sup>st</sup> July and the following 30<sup>th</sup> June.</p>																		
<b>Use</b>																				
3		The water taken in condition [XXX] shall only be used for irrigation of crops and pasture for grazing sheep, beef cattle, deer and viticulture, as described in the application, on the area of land shown in attached plan CRC [XXX].																		
4		<p>The consent holder shall take all practicable steps to:</p> <p>(a) Ensure that the volume of water used for irrigation does not exceed that required for the soil to reach field capacity; and</p> <p>(b) Avoid leakage from pipes and structures; and</p> <p>(c) Avoid the use of water onto non-productive land such as impermeable surfaces and river or stream riparian strips.</p>																		
5		<p>If the irrigation system used to distribute water taken in terms of this permit is used to distribute effluent, fertiliser or any other added contaminant, a backflow preventer manufactured in accordance with AS 2845.1 (1998) or the American Society of Sanitary Engineers standards shall be installed within the pump outlet plumbing or within the mainline, to prevent the backflow of water into the bore.</p> <p>The backflow preventer shall be tested to the standard set out in AS 2845.3 (1993) or an equivalent method within one month of its installation and annually thereafter by a suitably qualified person. A test report shall be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within two weeks of each inspection.</p>																		
<b>Mitigation</b>																				
6		<p>(a) For the period 1 November to 30 April the taking of water for irrigation purposes in terms of this consent shall cease whenever the flow in the Omarama Stream as estimated by the Canterbury Regional Council at either of the following sites is at or below the following flows</p> <table border="1"> <thead> <tr> <th>SITE</th> <th>MAP REFERENCE</th> <th>FLOW (Litres per second)</th> </tr> </thead> <tbody> <tr> <td>Omarama Station Bridge</td> <td>NZMS 260 H39:678-306</td> <td>500</td> </tr> <tr> <td>Tara Hills Recorder</td> <td>NZMS 260 H39:624-260</td> <td>250</td> </tr> </tbody> </table> <p>(b) For the period 1 May to 31 October the taking of water for irrigation purposes in terms of this consent shall cease whenever the flow in the Omarama Stream as estimated by the Canterbury Regional Council at either of the following sites is at or below the following flows.</p> <table border="1"> <thead> <tr> <th>SITE</th> <th>MAP REFERENCE</th> <th>FLOW (Litres per second)</th> </tr> </thead> <tbody> <tr> <td>Omarama Station Bridge</td> <td>NZMS 260 H39:678-306</td> <td>1200</td> </tr> <tr> <td>Tara Hills Recorder</td> <td>NZMS 260 H39:624-260</td> <td>750</td> </tr> </tbody> </table> <p>(c) For the period 1 November to 30 April the taking of water for irrigation purposes in terms of this consent shall be reduced to half the maximum rate noted in condition (1) above, whenever the flow in the Omarama Stream at the Omarama Station Bridge recorder site (at or about map reference NZMS 260 H39:678-306), as estimated by the Canterbury Regional Council, is at or below 800 litres per second.</p> <p>PROVIDED THAT whenever the Canterbury Regional Council, in consultation with the Water Users Group representing all water users who are subject to this condition, has determined upon a water sharing regime which restricts abstraction from the Omarama Stream in accordance with the minimum flow of 500 litres per second at the Omarama Station Bridge recorder site, then the taking of water in accordance with that determination shall be deemed to be a compliance with this condition.</p>	SITE	MAP REFERENCE	FLOW (Litres per second)	Omarama Station Bridge	NZMS 260 H39:678-306	500	Tara Hills Recorder	NZMS 260 H39:624-260	250	SITE	MAP REFERENCE	FLOW (Litres per second)	Omarama Station Bridge	NZMS 260 H39:678-306	1200	Tara Hills Recorder	NZMS 260 H39:624-260	750
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7		<p>A fish screen shall be installed, operated and maintained on the intake to ensure that fish are prevented, as far as is practicable, from passing into the intake.</p> <p>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; and</p> <p>The fish screen shall be designed and installed in general accordance with Fish Screening: good practice guidelines for Canterbury, NIWZ Client Report: CHC 2007. 092, October 2007</p> <p>The fish screen specified in Condition [XXX] (a) shall be designed or supplied by a suitably qualified person who shall ensure that the design criteria specified in Condition [XXX] (a)-(c) 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 shall be provided to the Canterbury Regional Canterbury.</p> <p>Prior to the exercise of this consent a certificate shall be provided to the Canterbury Regional 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 the Canterbury Regional Canterbury in accordance with Condition [XXX] (d) of this consent;</p> <p>The fish screen shall be maintained in good working order.</p> <p>Records shall be kept of all inspections and maintenance, and those records shall be provided to Environment Canterbury upon request.</p>
		<p>If the irrigation system used to distribute water taken in terms of this permit is used to distribute effluent, fertiliser or any other added contaminant, a backflow preventer manufactured in accordance with AS 2845.1 (1998) or the American Society of Sanitary Engineers standards shall be installed within the pump outlet plumbing or within the mainline, to prevent the backflow of water into the waterway.</p> <p>The backflow preventer shall be tested to the standard set out in AS 2845.3 (1993) or an equivalent method within one month of its installation and annually thereafter by a suitably qualified person. A test report shall be provided to the Canterbury Regional Council within two weeks of each inspection.</p>
<b>Measuring &amp; Metering</b>		
8		<p>The consent holder shall, prior to exercising this consent, install 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 10 percent.</p> <p>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.</p> <p>The flow at the measuring site shall be gauged at least every three months whilst this consent is being exercised, and at any other time when required as determined by a site inspection, to be carried out at least once every month.</p> <p>Gaugings and site inspections shall be carried out in accordance with the following manuals: Hydrologists Field Manual (NIWA 1991) and Procedure for Rating a Flow Station (NIWA 1993) or any equivalent publication.</p> <p>The level of water in the race, and times of abstraction, shall be recorded by electronic means, at not greater than fifteen minute intervals in a tamper-proof recording device such as a data-logger, kept for that purpose. The recorded data shall not be changed or deleted by any person, unless twelve months have passed since the date of recording.</p> <p>The measuring and recording devices described in clauses (a) and (e) shall be available for inspection at all times by the Canterbury Regional Council.</p> <p>All data from the recording device described in clause (e), and the corresponding relationship between the water level and flow, shall be provided to the Canterbury Regional Council on request, and shall be accessible and available for downloading at all times by the Canterbury Regional Council.</p> <p>Within one month of the commencement of this consent, at two-yearly intervals thereafter, and at any other time when requested by Canterbury Regional Council, the consent holder shall calibrate the measuring device and provide to the Canterbury Regional Council:</p> <p>A certificate signed by a suitably qualified person certifying the current accuracy of the measuring and recording devices, and also certifying that data from the recording device described in clause (e) can be readily accessed in accordance with clause (f); and</p> <p>Supporting information containing details of the calibration test.</p>
		<p>Within one month of the installation of the measuring or recording device(s) or any subsequent replacement measuring or recording device(s), and at five-yearly intervals thereafter, and at any time when requested by the Council, the consent holder shall provide a certificate to the Canterbury Regional Council, signed by a suitably qualified person certifying, and demonstrating by means of a clear diagram, that:</p> <p>Each measuring and recording device(s) is installed in accordance with the manufacturers</p>

		specifications; and Data from the recording device can be readily accessed and/or retrieved in accordance with the conditions above.
<b>Administrative Conditions</b>		
14	AD01	
15	AD03	
16	AD04	

## CRC011363 – TO UNDERTAKE WORKS WITHIN THE BED OF VARIOUS WATERWAYS

No.	Consent Code	Details
<b>Scope</b>		
1	LU01	The works shall be limited to the disturbance of the bed and banks of the Little Omarama Stream, <a href="#">Omarama Stream</a> , Twaddles Creek and Middle Gully for the purpose of the placement, extension, removal or demolition associated with maintenance of intake structures and diversion channels for the diversion and abstraction of water under consent CRC011361 and CRC011362 [These consent numbers may change depending on how the consent are split. For a discussion of this, refer to Report 11A].
<b>Location</b>		
2	LU02	Cross reference to Condition: 1 Waterbody and grid reference. Little Omarama Stream, NZMS 260 H40:635-166. <a href="#">Omaram Stream, NZMS 260 H 40:613-159 and H40:615-177</a> Twaddle Creek, NZMS 260 H40:603-198. Twaddle Creek, NZMS 260 H39:606-219. Middle Gully, NZMS 260 H40:614-192.
<b>Limits of Works</b>		
3	LU07	
<b>Erosion Protection</b>		
4	LU12	
5	LU13 modified	Works shall not be undertaken in a manner likely to cause erosion of, or instability to, the banks or bed of the Little Omarama Stream, <a href="#">Omarama Stream</a> , Twaddle Creek or Middle Gully; or reduce the flood-carrying capacity of these waterways.

<b>Prior to Construction</b>		
6	Non standard	The Canterbury Regional Council Compliance Monitoring Officer shall be notified at least 48 hours prior to the commencement of work.
7	LU08	
<b>During Construction</b>		
8	LU18	
9	LU21	
10	LU23 modified	All practicable measures shall be undertaken to minimise vehicles and machinery entering the Little Omarama Stream, Twaddle Creek or Middle Gully.
11	LU22	
12	LU26	
13	LU24	
14	LU25	
<b>Upon Completion</b>		
15	LU28	
16	Non standard	<u>This application seeks the ability to undertake works to divert the streams. Given this, it will be impossible for the applicant to comply with this condition.</u>
<b>Administrative Conditions</b>		
17	AD03	
18	AD04	

## **CRC011362 – TO DISCHARGE WATER**

<b>No.</b>	<b>Consent Code</b>	<b>Details</b>
<b>Scope</b>		
1		<p>Water shall only be discharged to the Omarama Stream at or about map reference NZMS 260 [map reference], as shown on Plan [CRCnumber].</p> <p>The discharge shall only be water from the irrigation race.</p> <p>Water shall only be discharged at a rate not exceeding 170 litres per second.</p> <p>Water shall only be discharged to the Omarama Stream at or about map reference NZMS 260 [map reference], as shown on Plan [CRCnumber].</p> <p>The discharge shall only be water from the irrigation race.</p> <p>Water shall only be discharged at a rate not exceeding 350 litres per second</p> <p>Water shall only be discharged to the Omarama Stream at or about map reference NZMS 260 [map reference], as shown on Plan [CRCnumber].</p> <p>The discharge shall only be water from the irrigation race.</p>

		<p>Water shall only be discharged at a rate not exceeding 290 litres per second</p> <p>Water shall only be discharged to the Twaddles Creek at or about map reference NZMS 260 [map reference], as shown on Plan [CRCnumber].</p> <p>The discharge shall only be water from the irrigation race.</p> <p>Water shall only be discharged at a rate not exceeding 540 litres per second</p>
<b>Operation and Maintenance</b>		
2	LU02	<p>(a) All practicable measures shall be undertaken to avoid erosion of the bed or banks of the Omarama Stream and Twaddles Creek occurring as a result of the discharge.</p> <p>(b) In the event of any erosion occurring to the bed or banks of the Omarama Stream and Twaddles Creek as a result of the discharge, the consent holder shall be responsible for rectifying the situation as soon as practicable.</p>
		The discharge, after reasonable mixing, shall not cause a change in the colour or a reduction of the clarity of the receiving water body
<b>Administrative Conditions</b>		
17	AD03	
18	AD04	

# APPENDIX D – FARM MANAGEMENT PLANS



# APPENDIX E – DEROGATION APPROVAL



meridian

4 August 2009

Gillian Ensor  
Environment Canterbury  
PO Box 345  
Christchurch

Dear Gillian

**Application by Dunstan Peaks Limited**

- 1 We write to you to outline the basis of Meridian Energy Limited (*Meridian*) providing its derogation approval to the applications numbered CRC011361 and CRC011362 by Dunstan Peaks Limited (DPL). We refer to the letter to ECan from Chapman Tripp dated the 26<sup>th</sup> of June 2008 setting out Meridian's position on derogation approvals generally.
- 2 Meridian has read and considered the applications CRC011361 and CRC011362 by DPL and provides derogation approval on the following basis:
  - 2.1 DPL shall only be entitled to divert water from Little Omarama Stream to an irrigation race (at map reference H40: 635-166) at a maximum rate of 170 litres per second and a volume not exceeding 4,896 cubic metres per day;
  - 2.2 DPL shall only be entitled to take and use water from a header pond (at map reference H40: 635-166) at a maximum rate of 170 litres per second for the irrigation of up to 30ha identified in the application;
  - 2.3 The maximum daily volume shall not exceed 4,896 cubic metres per day and the annual volume shall not exceed 180,000 cubic metres per annum and this shall be allocated as an agricultural and horticultural activity upstream of Waitaki Dam but not upstream of the outlets of the glacial lakes under Rule 6, Table 5 of the Waitaki Catchment Water Allocation Regional Plan;
  - 2.4 DPL shall only be entitled to take and use water from Little Omarama Stream (at map reference H40: 628-183) at a maximum rate of 30 litres per second for stockwater supply identified in the application;
  - 2.5 The maximum daily volume shall not exceed 2,592 cubic metres per day and the annual volume shall not exceed 946,080 cubic metres per annum and this shall be allocated as an agricultural and horticultural activity upstream of Waitaki Dam but not upstream of the outlets of the glacial lakes under Rule 6, Table 5 of the Waitaki Catchment Water Allocation Regional Plan;

- 2.6 DPL shall only be entitled to divert water from Omarama Stream into an irrigation race (at map reference H40: 613-159) at a maximum rate of 350 litres per second and a volume not exceeding 18,900 cubic metres per day;
- 2.7 DPL shall only be entitled to take and use water from an irrigation race (at map reference H40: 613-159) at a maximum rate of 350 litres per second for the irrigation of up to 115ha identified in the application;
- 2.8 The maximum daily volume shall not exceed 18,900 cubic metres per day and the annual volume shall not exceed 690,000 cubic metres per annum and this shall be allocated as an agricultural and horticultural activity upstream of Waitaki Dam but not upstream of the outlets of the glacial lakes under Rule 6, Table 5 of the Waitaki Catchment Water Allocation Regional Plan;
- 2.9 DPL shall only be entitled to divert water from Omarama Stream into an irrigation race (at map reference H40: 615-177) at a maximum rate of 290 litre per second and a volume not exceeding 11,185 cubic metres per day;
- 2.10 DPL shall only be entitled to take and use water from an irrigation race (at map reference H40: 615-177) at a maximum rate of 290 litres per second for the irrigation of up to 170ha identified in the application;
- 2.11 The maximum daily volume shall not exceed 11,185 cubic metres per day and the annual volume shall not exceed 1,020,000 cubic metres per annum and this shall be allocated as an agricultural and horticultural activity upstream of Waitaki Dam but not upstream of the outlets of the glacial lakes under Rule 6, Table 5 of the Waitaki Catchment Water Allocation Regional Plan;
- 2.12 DPL shall only be entitled to divert water from Twaddles Creek into an irrigation race (at map reference H40: 603-198) at a maximum rate of 100 litres per second and a volume not exceeding 8,640 cubic metres per day;
- 2.13 DPL shall only be entitled to dam water up to a maximum volume of 45,000 cubic metres (at map reference H40: 613-168);
- 2.14 DPL shall only be entitled to take and use water from an irrigation race (at map reference H40: 603-198) at a maximum rate of 100 litres per second for the irrigation of 15ha identified in the application;
- 2.15 The maximum daily volume shall not exceed 8,640 cubic metres per day and the annual volume shall not exceed 90,000 cubic metres per annum and this shall be allocated as an agricultural and horticultural activity upstream of Waitaki Dam but not upstream of the outlets of the glacial lakes under Rule 6, Table 5 of the Waitaki Catchment Water Allocation Regional Plan;
- 2.16 DPL shall only be entitled to divert water from Middle Gully into an irrigation race (at map reference H40: 614-192) at a maximum rate of 150 litres per second and a volume not exceeding 90,720 cubic metres per day;



meridian

- 2.17 DPL shall only be entitled to dam and hold water from the irrigation race in a storage header pond at a maximum volume of 45,000 cubic metres (at map reference H40: 616-159);
  - 2.18 DPL shall only be entitled to divert water from an irrigation race (at map reference H40: 613-197) at a maximum rate of 115 litres per second and a volume not exceeding 69,552 cubic metres per day;
  - 2.19 DPL shall only be entitled to take and use water from an irrigation race at a maximum rate of 115 litres per second for micro hydro generation (at map reference H40: 613-197) at Dunstan Peaks;
  - 2.20 DPL shall only be entitled to divert water from Twaddle Creek into an irrigation race (at map reference H40: 606-219) at a maximum rate of 45 litres per second and a volume not exceeding 3,888 cubic metres per day;
  - 2.21 DPL shall only be entitled to take and use water from an irrigation race (at map reference H40: 606-219) at a maximum rate of 45 litres per second for the irrigation of 12 ha identified in the application;
  - 2.22 The maximum daily volume shall not exceed 3,888 cubic metres per day and the annual volume shall not exceed 72,000 cubic metres per annum and this shall be allocated as an agricultural and horticultural activity upstream of Waitaki Dam but not upstream of the outlets of the glacial lakes under Rule 6, Table 5 of the Waitaki Catchment Water Allocation Regional Plan;
- 3 Any amendment or modification to the above will require further written derogation approval from Meridian. On the same basis any subsequent variation, transfer or replacement application that is relevant to the volume or location of the take may also require further approval.
  - 4 This letter is not an affected party approval to the consent application under section 94 of the Resource Management Act. Meridian may choose to submit in support or oppose the application on grounds which do not relate to the derogation of its rights, or not to submit at all.
  - 5 This letter does however record (subject to the above) that Meridian will not oppose the granting of the DPL application on the grounds that it will reduce the quantity of water available under Meridian's existing consents.
  - 6 Please advise if any basis for Meridian's approval outlined in paragraph 2 will not be met by the resource consent.

Yours sincerely

