

APPLICANT: OTEMATATA STATION LTD

REPORT OF CATHY BEGLEY

Consent ID	Description	Table 3 Location	Table 5 Location
CRC020355	To take and use water from Lake Waitaki at a maximum rate of 35 L/s for the irrigation of 37 ha of crop and pasture.	Lake Waitaki	Upstream of Waitaki Dam, but not upstream of the outlets of glacial lakes.
CRC041033	To divert water from Glen Bouie Stream into an open irrigation race a maximum rate of 400L/s. To divert water from Backyard Stream into an open irrigation race at a maximum rate of 400L/s. To take and use water from a storage pond at a maximum rate of 75L/s for the irrigation of 120 ha of crops and pasture.	All other rivers and Streams	Upstream of Waitaki Dam, but not upstream of the outlets of glacial lakes.
Activity Status			
<p><u>Rule 2, Table 3 WCWARP:</u> No allocation limit is specified for either Lake Waitaki or “all other stream”. Further the applicant is proposing the Lake Waitaki minimum lake level and a minimum flow for Glen Bouie has been determined as the 1 in 5 year, 7 day low flow 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>Overall status: Any activities that complies with Rules 2 and 6 is a discretionary activity under Rule 15</p>			
Consent ID	Description		
CRC052742	To dam up to 300,000m ³ of water within a purpose built compact earth storage pond within the bed of an unnamed tributary of Corbies Creek.		
Activity Status			
<p><u>TRP:</u> 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>Overall status: Discretionary</p>			

Consent ID	Description
CRC052740	To disturb the beds of Glen Bouie Stream and Backyard Stream to construct and maintain intake structures.
Activity Status	
<p><u>TRP:</u> 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>Overall status: Discretionary</p>	
Consent ID	Description
CRC052741	To construct and maintain a compact earth storage pond within the bed of an unnamed tributary of Corbies Creek with the ability to store up to 300,000m ³ of water
Activity Status	
<p><u>TRP:</u> 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>Overall status: Discretionary</p>	
Consent ID	Description
CRC052739	<p>To discharge water from the open irrigation race into Backyard stream at a maximum rate of 500L/s.</p> <p>To discharge water from an open irrigation race into a storage pond at a maximum rate of 500L/s.</p>
CRC052743	To discharge water into an unnamed tributary of Corbies Creek from an emergency spillway.
Activity Status	
<p><u>TRP:</u> 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>Overall status: Discretionary</p>	

1 PROPOSAL

1. Otematata Station Ltd (herein referred to as "the applicant") applied for CRC020355 on the 17 August 2001 which sought to take up to 35L/s from Lake Waitaki to enable the spary irrigation of up to 37 ha of crop, pasture.
2. The area to be irrigated is shown on the plan attached in Appendix A.
3. CRC041033 was applied for on the 14 November 2003 and sought the ability to divert, take and use up to 1m³/s from Glen Bouie Stream into an existing irrigation/stockwater race. This race is then to be used to convey water from Glen Bouie Stream to Backyard Stream. The water in the race is then discharged into Backyard Stream. Backyard Stream is then to be used to convey water to another, yet to be constructed, irrigation race and conveyed to a 300,000m³ on farm storage pond. Following notification, the applicant has amended the application so that under "normal" flow conditons (i.e whenever the flow in the Otamatapaio River is above 200L/s but below 600L/s) the maximum rate at which water is diverted from Glen Bouie Stream is no more than 100L/s. However, the applicant would like the abity to take up to 400L/s whenever the flow in the Otamatapaio River is above 600L/s.
4. Further in the application lodged in November 2003 the applicant sought the abilty to take up to 75L/s from the storage pond to irrigate up to 163 ha of alnd. The area of land that is to be irrigated has also been reduced from the origianl 163 ha to 120 ha. Of this 120 ha the applicant has the ability to irrigate 90 ha of this via CRC012017. As has been outlined by Ms Johnston this application seeks to divert, take and use up to 110 L/s from Corbies Creek for the irrigation of 210 ha of land located on three neighbouring stations. The applicant is one of these stations. It is anticipated that these two consnets (CRC012017 and CRC041033) would be used in concurrently to irrigate the 120 ha of land.
5. The area to be irrigated is shown on the plan attached in Appendix A.
6. This application also seeks the ability to undertake works within the bed of Glen Bouie Creek. As has been stated previously the is an exisitng irrigation/stockwater race that has been in palce for a number of years and the applicant seeks the abilty to up grade (if necessary) and maintain the existing diversion and intake strucutres. The works to maintan these existing strucure will involve the removal of any debris that may have built up (i.e. gravel) around the intake. It is also proposed to install within the bed of Backyard Stream a discharge strcutre in its headwaters, to allow water to be discharged into the stream. The applicant propsoes to use Backyard Stream to conveye water to a new intake strucutre that will be lcoated at the donwstream end of Backyard Stream. This intake strucutre will be used to capter the dishcarged water and coveyed to the storage pond.
7. The applicant also seeks the ability to construct an earthen dam that has the ability to hold at least 300,000m³ of water. It is anticipated that this dam will be located within an ephemeral tributary of Corbies Creek which only ever has water flowing in it following prologed and/or heavy rain. It is anticipated that the height of the dam will be no more than 15m, with a water depth of around 14m and a freeboard (i.e. the distance between the crest height of the dam and the water level) of 800mm. To maintain the freeboard the dam will contain a spillway with an invert level which will ensure than the freeboard is maintained.

1.1 Timeline and Summary of Amendments made to the Applications

Timeline	CRC020355	CRC041033 CRC052739 CRC052740 CRC052741 CRC052742 CRC052743
Date of Lodging	17 August 2001	14 November 2003
Notifiable Date	26 February 2002	21 March 2005
Public Notification	4 August 2007	4 August 2007

8. As set out above, the application to take and use water from Lake Waitaki was lodged in October 2001. Between October 2001 and September 2002 the CRC requested further information on the type of pasture to be irrigated along with advising that a number of parties were adversely affected.
9. CRC041033 was lodged on the 14 November 2003 and sought to divert, take and use up to 1m³/s from Glen Bouie Stream into an irrigation race. This race is to be used to convey water from Glen Bouie Stream to Backyard Stream. Backyard Stream is then to be used to convey water from the end

of the irrigation race to another “new” irrigation race that will convey water from Backyard Stream to the storage pond. Once the water is in the storage pond the water will be used to spray irrigate up to 120 ha of land. Between February 2005 and November 2008 the CRC made a number of requests for further information which sought to ensure that all necessary resource consent applications had been made and to clarify a number of matters associated with the applications. These requests resulted in the applicant applying for the necessary land use permits, discharge and water permit (the damming of water within the storage pond) in 2005 along with providing further information on the following matters:

- Providing an alternative minimum flows for the Glen Bouie Stream;
 - 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.
10. Prior to the hearing, the applicant has substantially reduced the rate at which they propose to take water from Glen Bouie Stream. It is now proposed to take up to 30L/s whenever the flow in the stream is above 10L/s but below 70L/s. Whenever the flow in the stream exceeds 70L/s the applicant propose to increase their rate of take from 30L/s to 200L/s. However to enable the applicant to take the full 200L/s the flow in Glen Bouie Stream would need to exceed 410L/s.

1.2 Water Source

11. Lakes Waitaki is considered to have high aesthetic and recreational values from a district/local perspective due to the fact that it is one of the three hydro lakes that are used extensively for recreational opportunities such as boating, fishing, camping etc. I note that Daly (2004)¹ notes that Lakes (Benmore, Avimore and Waitaki) are considered to have a moderate to low degree of naturalness, due to them being hydro lakes. However, he does note that a number of bird and fish species rely upon these lakes for habitat such as:
- Upland bullies;
 - Common bullies;
 - Long finned eel;
 - Brown trout;
 - Rainbow trout;
 - Sockeye salmon; and
 - Chinook salmon.

2 BACKGROUND INFORMATION

2.1 Farm Details

12. Otematata Station is farmed in conjunction with Avimore Station (which have water permit applications subject to this hearing) Awakino Downs and Little Awakino Station. The latter two areas have been used to grow out the young stock and as the hogget wintering blocks. What this means is that the property farmed by the applications extends from the shores of Lake Avimore and Lake Waitaki to the Hawkdon Range to the south.
13. In the 2008 year the properties carried 30,475 sheep, consisting of 10,798 weathers, 11,625 ewes, 7186 hoggets, 286 rams and 562 “others” and 399 cattle, consisting of 269 cows, 40 heffers, 14 bulls, 61 R1 heffers and 15 “others”.

¹ Daily A (2004), *Inventory of Instream Values for Rivers & Lakes of Canterbury New Zealand* Report U04/13 (Charteris DOC, pers., comm., 2004).

14. The applicant sees irrigation as an important step in being able to continue to farm the area as a viable long-term farming operation. Having irrigation also provides the applicant with some options available to them before entering tenure review. While the outcome of the tenure review process is unknown, it is possible that as a result of this process the area able to be farmed could be reduced (potentially even halved). Enabling the applicant to have irrigation will allow them to maintain their current stocking rates, even with a reduced farmable area. The irrigation will also provide the applicant with increased flexibility within their existing farming operation as the area to be irrigated will not be treated as a separate unit, rather it will be incorporated into the farming operation.
15. To date the applicants have been using a very traditional method of farming within the high county. This involves having extensive areas available for stock grazing. In general the ewes are placed on the easier better country with weathers placed on the higher undeveloped country during the summer. Prior to winter all stock are brought off the higher country and wintered on the lower country. It is the lower countries stock carrying capacity that determines the numbers of stock able to be farmed on these properties. This also means that the farming system currently used by the applicant has a heavy reliance on being able to use land at the higher altitudes, which the applicant acknowledges that other uses for this land exist, such as recreation and conservation.
16. Allowing the areas to be irrigated will allow for a greater level of flexibility within the applicant's existing farming operation. This flexibility will enable the applicant to have a level of confidence that they will be able to produce a high quality product. The greatest value is in the fact that the irrigation addresses, in part, some of the current limiting factors which are:
 - High variability in seasons. This variability leads to significant risks when taking on contracts (i.e. to grow lambs to a specific weight/condition etc) as the quality of the end product can be compromised.
 - Further the variability in seasons can also have a significant impact upon the economic viability of the farm. In particular if as a result of drought conditions, stock (both lambs, replacement stock and in particularly bad drought conditions breeding stock) have to be sold. If the latter occurs, it can take many years for the farm to recover and be back to pre drought stocking rates.
 - There is also a high variability in the quality and quantity of crops (such as oats and hay) grown specifically for winter-feed. Allowing irrigation will enable the application to have a greater level of flexibility in the types of crops grown for winter feed, in particular Lucerne could be grown.
 - To make sufficient winter feed large areas of un-irrigated land is required due to low growth rates of pasture. The larger the area needed, the higher the cost is of ensuring that sufficient winter feed is available.
 - If insufficient winter-feed can be made on-site, then additional winter feed needs to be brought in. Transporting such feed into the basin is a significant cost to the applicant.
17. Allowing irrigation will have significant benefits for the applicant in terms of increase in reliably being able to provide a high quality product, financial rewards as a result of producing a high quality product, increased flexibility in the farming operation and significant benefits in terms of animal husbandry. It should be noted that allowing irrigation will not significantly change the farming system, rather it will strengthen the existing operation.
18. The value of irrigation for the applicant is being able to have consistently high quality feed. This is critical to the farming operation. This is because the quality of the feed able to be produced on-site sets the platform for the whole year's production. Enabling the applicant to finish lambs, to lamb 2tooths on the property, which to date has been very difficult, increase pregnancy and calving rates of cattle along with diversifying into other high value crops such as viticulture, gives higher financial rewards with minimal costs when compared to having to sell stock from the property, usually at lower returns.
19. The applications to take water from Lake Waitaki will require the applicant to install a new intake structure. Currently the exact location and design of this intake is unknown. The applicant recognises that should these consents be granted, there may be a need to gain further consents from the both the CRC and Waikata DC to install the intake. However, the applicant is reluctant to gain such consents until there is a level of certainty around their ability to take and use water for irrigation.

2.2 McKenzie Irrigation Company Shares held

Name: Aviemore Ltd	Number
Property Shares	1
Irrigation Shares	30 (as 90 ha is able to be irrigated under CRC012017 for which derogation approval has been obtained).

20. Irrigation shares required for the following portion of the farm which represents new water.

2.3 Derogation Approval

21. Derogation approval for the take from Lake Waitaki was obtained in standard format from Meridian Energy Limited on 17 March 2009.
22. Derogation approval for the "joint" take (CRC012017) from Corbies Creek was obtained in standard format from Meridian Energy Limited on 8 September 2009.
23. Derogation approval for the take from Glen Bouie Creek was obtained in standard format from Meridian Energy Limited on 10 September 2009

3 COMMENTS ON SUBMISSIONS

Resource Consent	Submissions in support	Submission in opposition	Neutral
CRC020355	2	12	2
CRC041033	3	16	2
CRC052739	3	13	2
CRC052740	3	13	2
CRC052741	2	13	2
CRC052742	2	13	2
CRC052743	2	13	2

24. 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 submitter is concerned that at the time of notification the applicant did not hold sufficient MIC shares, along with the effects on water quality and flow metering requirements.	Oppose

25. LNZ submission highlighted that where the land to be irrigated is subject to a Crown Pastoral Lease for the terms of the lease to be amended to allow irrigation to occur. The applicant has gained consent to

cultivate pastroal lease land, with the irrigaiton of cultivated pastural lease land being a permitted activity. Thus no further consents from LINZ are required.

26. As outlined above, Meridian Energy Ltd have provided derogation approval and due to the fact that the applicant does hold sufficient MIC Shares to irrigate the 30 ha of “new” land. 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.

4 CRC020355 & CRC041033– TO TAKE AND USE WATER - ASSESSMENT OF ENVIRONMENTAL EFFECTS

4.1 Effects on other water users

Effects on other water users	
Comments	The CRC reporting officer for these applications agrees that effects on other water users are minor provided appropriate flow sharing regime is determined.

27. There is no other surface water abstractors either up or downstream of the proposed take from either Glen Bouie Stream or Backyard Stream. This is due to the fact that the land through which the Glen Bouie Stream flows (from its source to its confluence with Corbies Creek) and Backyard Stream is controlled by the applicant. Given this, the take from the stream will not impact upon any other water user or person whom relies upon the stream for other purpose such as domestic and stock water.
28. It should be noted that the Glen Bouie Creek is a tributary of Corbies Creek which the applicant and two other stations rely upon for irrigation water. Even though there is some distance between the two points of take, there is the possibility that the taking of water from Glen Bouie Creek could impact upon the reliability of supply enjoyed by these other users. To address this aspect, a water users group will be formed to ensure that the taking of water from Glen Bouie Creek does not impact upon the reliability of supply to downstream users. It should be noted that the applicant is one of the downstream take that Ms Penman refers to in her evidence. Therefore, it is not in the applicant’s interest to affect the reliability of supply to this downstream take. As has been outlined by Ms McCabe and Ms Johnston, a MOU is in place which to ensure that the various users do not impact upon each other.
29. There are no other surface water abstractors within a 500 meter radius of the applicants proposed points of take on Lake Waitaki. I note that the nearest neighboring intake (CRC011947) is located approximately 900m to the south of the applicants point of take on a tributary stream of Lake Waitaki. I also note that Meridian Energy Ltd’s Avimore Dam is located approximately 1 km upstream of the proposed point of take. Given this, the take from the lake will not impact upon any other water user or person whom relies upon the lake for other purpose such as domestic and stock water.
30. These proposed takes sit 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 m³/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 will not be exceeded.
31. Further, the applicant has gained derogation approval form Meridian Energy Ltd and as such the granting of the proposed takes will not impact upon it’s 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	Lake Waitaki minimum Lake levels All other rivers and streams
Comments	<p>A minimum lake level of 227m a.m.s.l is proposed</p> <p>A minimum flow of 10 L/s as measured upstream of the Glen Bouie Intake is proposed.</p> <p>The CRC reporting officer for these applications agrees that effects on ecosystems are minor provided fish screen in place and 1:1 sharing above mean flow.</p>

32. Table 3 of the WCWARP sets a specific minimum lake level for Lake Waitaki to ensure that the instream values of the lake is protected. The applicant is proposing to cease taking water whenever the lake level within Lake Waitaki reaches 227m a.m.s.l, thereby ensuring that the instream values of the lake is protected.
33. Table 3 of the WCWARP does not set a specific minimum flow regime for Glen Bouie Stream rather it provides a formula by which a minimum flow is to be determined. 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.
34. As outlined in Mr Boraman's evidence, it has been calculated that the 5-year 7-day low flow for Glen Bouie Stream is 10L/s. I understand that both Mr Sewart (the CRC hydrologist) and Mr Scarf (F & G and DoC's hydrologist) agree that 10L/s is acceptable. As the proposed take will be located downstream of the minimum flow point, the applicant will need to start reducing their rate of take whenever the flow in the stream reaches 40L/s. Further, the applicant proposes to limit the rate at which water is taken from the stream to 200L/s. As outlined in Mr Boraman's evidence to enable the applicant to take the full 200L/s the flow in the stream (Glen Bouie) will need to be in excess of 410L/s.
35. However, as the applicant is located within the sensitive Otamatapaio River catchment, the applicant is proposing to abide by the Otamatapaio River minimum flow regime as well as the specific Glen Bouie minimum flow regime. This would see the applicant only taking up to 30L/s whenever the flow in the Otamatapaio River is between 200 - 450L/s. Whenever the flow in the Otamatapaio River is in excess of 600L/s the applicant proposes to take up to 200L/s provided the flows within Glen Bouie stream also allow this volume of water to be taken.
36. Given the proposed minimum flow is consistent with the formula set out within Table 3 of the WCWARP, the effects of the diversion and taking of water on the instream values of Glen Bouie Creek are considered to be minor.
37. When water is taken either directly from a waterbody or an irrigation race that has been in place for some time, 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 the existing diversion structure on Glen Bouie Stream there is no fish screen in place. In some circumstances, such races can provide significant aquatic habitat which can be impact upon if fish screens are installed at the point of diversion. For both takes (i.e. from Lake Waitaki and Glen Bouie Stream) the applicant is proposing a mitigation measure which would require them to "as far as is practicable" exclude fish from entering the intake. To this end, prior to the exercising of this consent, the applicant will have their intakes either audited and/or designed and certified by a suitably qualified person to ensure that their fish screen as far as is practicable excludes fish and is 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 CRC020355 – Lake Waitaki

Reasonable and Efficient Use Seasonal Volumes and Land Us	
Land Use	Mixed (Cropping, Sheep and Beef)
Area to be irrigated (hectares)	37 ha
Method of application	Spray
Efficiency of application	80%
Daily application depth	4.4 mm
Return period	10 days
Return period application depth	44 mm
Soil profile available water	15 % (5.51 ha) Light Soils 85 % (31.45 ha) Medium Soils
Mean Annual Rainfall	210 mm
Seasonal volume required (m ³ /year)	222,000 m ³ /year
Seasonal volume Schedule WQN9v2 (m ³ /year)	203,408 m ³ /year
Seasonal volume Irrical (m ³ /year)	282,330 m ³ /year
Volume to be included in Table 5 (WCWARP) allocation	222,000m ³ /year
Comments	The proposed annual volume is based upon the applicants Mackenzie Irrigation Company share holding. For spray irrigation 1 share = 600 mm/ha/year or 6,000m ³ /year. Schedule WQN9v2 is 203,408 m ³ /year which is less than that proposed, however, the Irrical annual volume is 282,330 m ³ /year which is more than the proposed annual volume

4.3.2 CRC041033 – Glen Bouie Stream/ Backyard Stream/ Storage Pond

Reasonable and Efficient Use Seasonal Volumes and Land Use	
Land Use	Mixed (Cropping, Sheep and Beef)
Area to be irrigated (hectares)	120 ha
Method of application	Spray
Efficiency of application	80%
Daily application depth	4.3 mm
Return period	10 days

Return period application depth	43 mm
Soil profile available water	80 mm – 90 mm
Mean Annual Rainfall	200 mm
Seasonal volume required (m³/year)	180,000m ³ /year (for the 30 ha not irrigated using CRC012017) A cumulative an annual volume of 1,179,820 m ³ /year is required.
Seasonal volume Schedule WQN9v2 (m³/year)	660.000 m ³ /year for whole 120 ha to be irrigated. However if only looking at 30 ha not irrigated using CRC012017 an annual volume of 165,000m ³ /year would be appropriate.
Seasonal volume Irrical (m³/year)	175,413 m ³ /year
Volume to be included in Table 5 (WCWARP) allocation	180,000m ³ /year however a cumulative an annual volume of 1,179,820 m ³ /year is proposed.
Comments	There are two annual volumes that are proposed for this take. Firstly the annual volume associated with the applicants MIC shareholding for the 30 ha current not irrigated using CRC012017. CRC012017 allows the applicant to irrigate 90 ha using 999,802m ³ /year. This annual volume is less than that provided by Irrical for this area. The applicants MIC shareholding allows them to take up to 180,000m ³ /year which is slightly more than the 175,413m ³ /year provided by Irrical. Overall a cumulative annual volume of 1,179,820m ³ /year is proposed.

38. 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.
39. The applicant will be applying 44 mm and 43 per 10 days which is no more than half of the average water holding capacity of the soil on each site, and as such is considered to be an efficient use of water.
40. The applicant is proposes an annual volume of 222,000m³/year for the take from Lake Waitaki. This volume is based upon the applicants MIC shareholding. I note that using the methodology set out in Policy 16 (c) (ii) an annual volume of 203,408 m³/year would be acceptable. The latter annual volume is based upon mean rainfall of 210 mm/ha/year and the soils requiring 750 mm/ha/year. This annual volumes is less than that proposed. However, I note that Policy 16 (c) (i) also sets an alternative methodology for determining annual volumes. I note that using this methodology an annual volume of 282,330 m³/year would be acceptable. As the proposed annual volume is less than the volume determined under Policy 16 (c) (i) the use of water is considered to be efficient.
41. The applicant also proposes that the water taken from the dam will be used conjunction with CRC012017 to irrigate no more than 120 ha of land. To ensure that the use of water is efficient, the applicant is proposing a cumulative annual volume of 1,179,820m³/year. This annual volume is based upon the annual volume outlined above (180,000m³) and the applicants “share” of CRC012017 which is 999,820m³/year. I note that Ms Johnston in her evidence has outlined that the annual volume proposed under CRC012017 is an efficient use of water using Irrical methodology which is consistent with Policy 16 (c) (i). Further as outlined above, an annual volume of 180,000m³/year proposed for the 30 ha is not covered by CRC012017.
42. The annual volume for the 30 h not covered by CRC01017 is based upon the applicants MIC shares. It is recognised that the MIC shares are based upon 600mm/ha/year being applied. To ensure that the annual volume associate with the 30ha of “new” water is efficient, Irrical has been used. This methodology is considered to be consistent with Policy 16 (c) (i). Using this methodology an annual volume of 175,413 m³/year is appropriate. The latter annual volume is very slightly less than that proposed by the applicant, even so the use of water (both new and cumulatively) is considered to be appropriate.

43. However, Ms Penman (paragraph 55 of Report 30B) has determined that a annual volume of 660,000m³/year would be an appropriate. This is based upon the soils requiring 750 mm/ha/year and an effective rain fall of 210mm/ha/year. This annual volume is based upon the methodology set out within Policy 16 (c) (ii). However, Ms Penman in her assessment fails to take into account the fact that the applicant proposes to use their “share” of CRC012017 to irrigate the 120ha, and as such the annual volume attached to this consent should reflect this. As outlined above, 90 ha of the 120 ha can be irrigated using CRC012017 with an associated annual volume of 999,820 m³/year. The additional 30 ha (giving a total of 120Ha) is to be irrigated using “new water” for which the applicant has gained sufficient MIC shares.
44. I also note in Ms Penman’s report (30B) she states that the existing race connecting Glen Bouie Stream to Backyard Stream may not meet Policy 19. This policy “encourages” the piping or otherwise sealing of water distribution systems. This policy goes on to state that “...where appropriate requiring their progressive upgrade and piping where there is an environmental and/or economic net benefit for so doing, but recognising that some may provide significant habitat.” The applicant recognises that the current race will need to be upgraded to minimise leakage. Upgrading this race would occur at same time as the building of the dam. Further, given the proposed rates of take, it is in the applicants interest to ensure that as much water as is possible reaches the dam from Glen Bouie Stream. Ms Penman’s in her paragraph 60, states that the existing race will need to be upgraded to ensure that it, as efficiently as is possible conveys water. As outlined above, the necessary upgrades are proposed however, the specifics (i.e. exactly what needs to be done and when this will be done) is highly dependant upon whether this application is granted.
45. 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

Water Quality	
Comments	<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>

46. 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.
47. 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.
48. 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.

	Nitrogen Threshold	Phosphorous Threshold
MWRL Water Quality Study Property Thresholds	97,622	2,206
OVERSEER® outputs	80,466	788

49. 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.

50. 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).
51. 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.
52. 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.
53. For Aviemore & Otematata Station, 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;
54. 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).
55. 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

Effects on Landscape	
Comments	<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>

56. 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.
57. The area to be irrigated is located by CRC020355 is located on the southern banks of Lake Waitaki, approximately 1.6km downstream of the Aviemore Dam. The Kurow – Otematata Road (SH 83) forms the sites most southern boundary.
58. The area to be irrigated by CRC041033 is located adjacent to Backyard Road. This road is used primary to provide access to parts of Bog Roy, Rostrevier and Otematata Station. The area is located some 10 km up Backyard Road from its intersection with Omarama Otematata Road (SH 83).
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

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

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	
Comments	The CRC reporting officer for these applications agrees that the effects on people and communities will not 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 CRC052742 – TO DAM WATER - ASSESSMENT OF ENVIRONMENTAL EFFECTS

67. CRC052739 seeks the ability to enable the applicant to store up to 300,000m³ of water within a purpose built on farm storage pond. The pond is to be located in a grassed depression within the applicant's property. This depression only ever carries water following a major rainstorm events, or snowmelt, which typically occurs once to twice a year. The maximum catchment area for the dam is approximately 50-60 ha in area, which is a very small catchment area.
68. As previously stated it is anticipated that the storage pond will be able to hold 300,000 m³ of water. To enable this to occur, the dam will have a maximum crest height of 15m.
69. As the storage ponds will be located out of stream, the primary effect to address is the effect of the dam failure. To assess this effect, a dam breach analysis has been undertaken by GHD and is contained within Appendix E.
70. This breach analysis shows that should the dam fail the peak discharge will be 300m³/s and it will take 11 minutes to fail with an average breach width of 13.5m. The water from the dam is more than likely to flow in a north-easterly direction (down the valley) and be intercepted by Corbies Creek at the northern end of the area shown on Figure 5 of this report. GHD has estimated that at this point, (where the water enters Corbies Creek) the water depth will be less than 25cm and as such is unlikely to result in a significant increase in water flowing in the stream.
71. GHD also notes that if the dam fails, water from the dam will flow over land owned and operated by an adjoining neighbor (Boy Roy Station). To this end, the dam breach analysis has been provided to Mr & Mrs Anderson of Bog Roy. They have stated that they do not have any concerns with water flowing over their property as a result of the dam failing. A copy of an e-mail from their consultant Ms Johnston confirming this is contained within Appendix F. The applicant is also in the process of consulting with the other adjoining landowner (Mr Munro).
72. Further, a copy of the dam breach analysis has been provided to Mr Tony Boyle (CRC) who has verbally confirmed that he agrees with the dam breach analysis. Given this, the effects of the dam are considered to be no more than minor.
73. However, in saying this, I note that Ms Penman on page 7 of Report 30C states that no assessment of the water quality contained within the dam itself has been provided. Therefore the effects of the dam may be more than minor. Unfortunately Ms Penman has not provided any assessment as to why she is concerned about the water quality within the dam. Therefore, I have assumed that she is alluding to the possibility that the water quality within the dam could deteriorate to a point where it is unable to be used for irrigation. I understand that when the Opuha Dam was first commissioned, the water quality within Lake Opuha deteriorated and impacted upon the aquatic values of the river downstream of the dam. One reason given for this was because the topsoil from the intensively farmed land, which formed the bed of the lake, was not removed prior to the lake being formed. This resulted in nutrients leaching from the topsoil and contaminating the lake.
74. In this particular situation, the soil that will form the bed of the storage pond has not been intensively farmed, nor has it had large amounts of fertilizer been applied to the area which could leach out and contaminate the water within the pond. Further there is no When the dam is being constructed, it may be necessary to strip what topsoil there is from the base of the dam, to enable the face of the dam to be covered with soil to enable grass to be established on the face of the dam. Such vegetation cover is very important to ensure that the face does not erode.
75. Further, the water quality of the dam will be a direct reflection of the quality of the water being put into the dam from Glen Bouie Stream and/or Backyard Stream. Therefore, I am confused as to why Ms Penman is concerned about the quality of water contained within the storage pond unless Ms Penman is concerned that the water quality of either or both Glen Bouie and/or Backyard Stream may not be of suitable quality for irrigation.

6 CRC052740 - TO DISTURB AND PLACE A STRUCTURE, FOR THE DIVERSION OF WATER, GLEN BOUIE AND BACKYARD STREAM - ASSESSMENT OF ENVIRONMENTAL EFFECTS

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

76. This application seeks the ability to maintain an existing intake and diversion structure within the bed of Glen Bouie Stream. As has been previously stated, the intake and irrigation race has been in place for a number of years, and this application simply seeks the ability to maintain the intake. Given this it is unlikely that the proposed works will not result in a reduction in the flood carrying capacity of the waterway.
77. However, the works within the bed of Backyard Stream will involve the construction of a diversion weir/intake structure. This application seek the ability to use Backyard Stream and a method of conveying water from the end irrigation race and as such this diversion/intake structure needs to have the ability to "pick up" the flow of Backyard Stream. The works within the bed of Backyard Stream will involve what the placement of an intake structure, which will include a radial gate to control the volume of water being diverted into the new race. Further, these works may also involve the placement of a small gravel weir in the bed of the stream.
78. An indicative design of the Backyard Stream intake is contained in Attachment 3 of Ms Penman's Report 30B.
79. When structures are inappropriately placed within the bed of waterways, these structures can result in the waterway reacting differently during a flood event. In this particular situation, the only structures that could impact upon the floodwater carrying capacity of these waterways is the small gravel weir being placed in the bed of the stream. The gravel weir is to be constructed from unconsolidated cobbles found within the bed of these streams. Should the stream flood or experience high flows, the weir would erode (or blow out), thereby ensuring that the floodwater carrying capacity of these streams is marinated.

6.2 Effects of the works on water quality

80. 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 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).
81. The most common approach used 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.
82. Another way of mitigating the effects of undertaking works within the waterway, it to limit the amount of time work occur 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.
83. Ms Penman has stated in her report (30B) that she is unable to determine whether the proposed works, in particular those associated with the installation of the intake structure within Backyard Stream will have more than minor effects on water quality, and there or these works may impact upon the aquatic ecosystems present in the waterway. I note that during the summer months, that Backyard Stream is ephemeral, in fact should this application be granted, the discharge of water into Backyard Stream from Glen Bouie Creek will be Backyard Streams only source of water. Given this, Backyard Stream is likely to have very limited aquatic values. Further, works can be timed to ensure that, as far as is practicable, the works to construct the intake occur when there is no flow within the stream. Given this, the effects of the proposed works on water quality is considered to be minor.

6.3 Effects on bank erosion and stability

84. 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 increase the erosion of that bank thereby meaning that the bank is less stable.
85. In this particular situation the purpose of the weir is to divert water from both Glen Bouie Stream and Backyard Creek into the irrigation race and as such will not extend across the full width of the stream. This also means that it's designed and installed to ensure that water is directed into the intake not directed towards an adjacent bank.
86. Further the rock weir consists of unconsolidated gravels which means that during a flood event it will be "blown out" or removed and as such it is considered unlikely that the proposed works will result in bank erosion or instability.

6.4 Effects on other artificial structures

87. When works occur in the beds of rivers within a close proximity of an existing 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 2 km radius of the proposed weir. Given this, the placement of the weir with the bed of the either Glen Bouie Stream or Backyard Stream is considered to be minor.

7 CRC052741 - TO CONSTRUCT A WATER STORAGE POND IN THE BED OF UNNAMED EPHEMERAL STREAMS - ASSESSMENT OF ENVIRONMENTAL EFFECTS

- 88. The works involve the construction of a water storage pond in a grassed depression. The depressions normally carry water approximately two times a year following an extreme rainfall event, or snow melt. The maximum catchment area for each pond is approximately 10 square kilometres.
- 89. Construction equipment consists of diggers, trucks and compaction equipment.

7.1 Effects of the works on flood-carrying capacity and flooding patterns of the river

- 90. The works to construct the storage pond will occur in grassed depression which only contains sheet flow following major rainstorm or snowmelt. While it is recognized that damming waterways can have a significant impact upon how the waterway reacts during a flood event, in this particular situation, it is questionable as to whether the depressions are in fact waterways.
- 91. However, in saying this, it is recognized that the dam will incorporate appropriately sized spillways. These spillways serve to ensure that once the dam is full, should any additional water make it way into the dam, whether this be by way of sheet flow or excess water from Glen Bouie/Backyard Stream, the excess water is be released from the dam is a safe manor. This way avoiding any overtopping of the dam crest (thereby weakening the dam) or scouring of the dam either the crest or the toe of the dam.

7.2 Effects of the works on water quality

- 92. The works occur in grassed depressions that flow typically two times a year. Therefore, there is no effect of the works on water quality.
- 93. Given this, effects on water quality will be minor.

7.3 Effects on other artificial structures

- 94. 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 km radius of the proposed weir. Given this, the placement of the weir with the bed of the Wairepo Stream is considered to be minor.

8 CRC052739 & CRC052743– TO DISCHARGE WATER INTO WATER ASSESSMENT OF EFFECTS

8.1 Effects of the discharge on water quality

95. This application seeks the ability to discharge water into Backyard Stream that have been taken from Glen Bouie Stream. Further this application also seeks the ability to discharge water from the storage pond from the spillway. Typically this will occur under emergency provisions.
96. In this situation Backyard Stream is being used to convey water from an irrigation race to the “new” irrigation race and eventually into the storage pond. As such there will be no surface water flow contained within Backyard Stream that could be affected by the quality of the water being discharge into it.
97. Further, the water being discharged from the storage pond during emergency situations will be into grassed depressions which do not contain any aquatic values. In Appendix B are photos showing the grassed depressions. I note that Ms Penman is unable to determine whether the proposed discharges will impact upon the water quality contained within these grassed depression. As these grassed depression do not contain any water, there will be minimal to no effects of the proposed emergency discharges on the quality of water contained within these depression. In fact, these emergency discharges may have a positive effect on water quality, as the water contained within these depression will be sourced from sheet flow or overland flow and will contain any contaminants such as sheep/cow faeces. The increase in water from the emergency discharges will increase the dilution of these contaminants when entering any downstream receiving environments.

8.2 Effects of the discharge on other water users

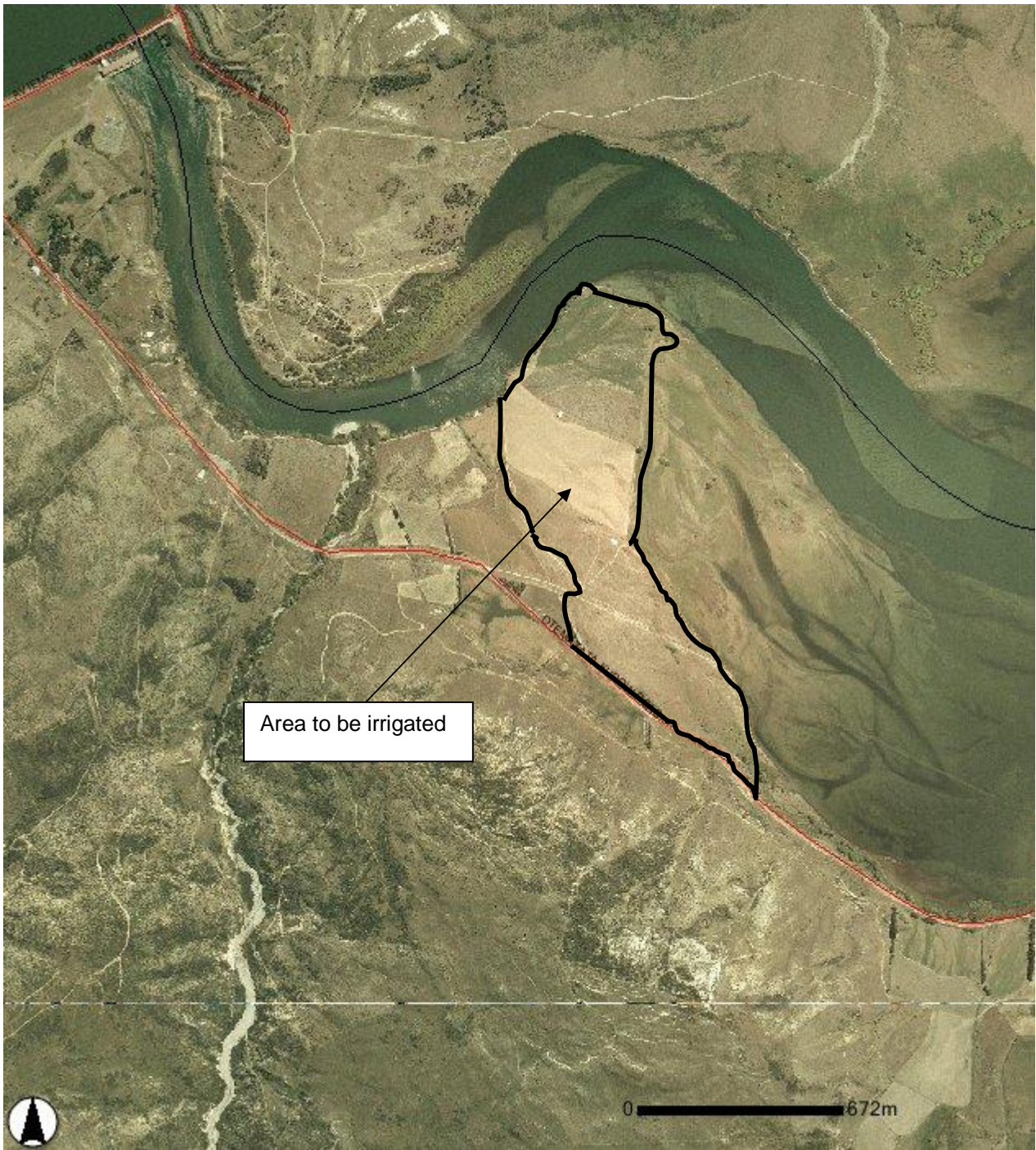
98. When water is discharged there is the potential to cause adverse effects on the recreational users of river/stream due to the contamination of the water. Contaminants such as suspended sediments (turbid water) affect recreational users because turbid water is aesthetically unappealing and unsuitable for bathing and other contact recreation.
99. 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...”.
100. As previously stated, there are no other persons downstream of the application point of discharge that rely upon either Backyard Stream or the grassed depression for either their domestic or stockwater supply. Therefore the effects of the proposed discharges on other water users is considered to be *de minimums*.

8.3 Effects of discharge of water on erosion of the bed and banks of the receiving waterbody

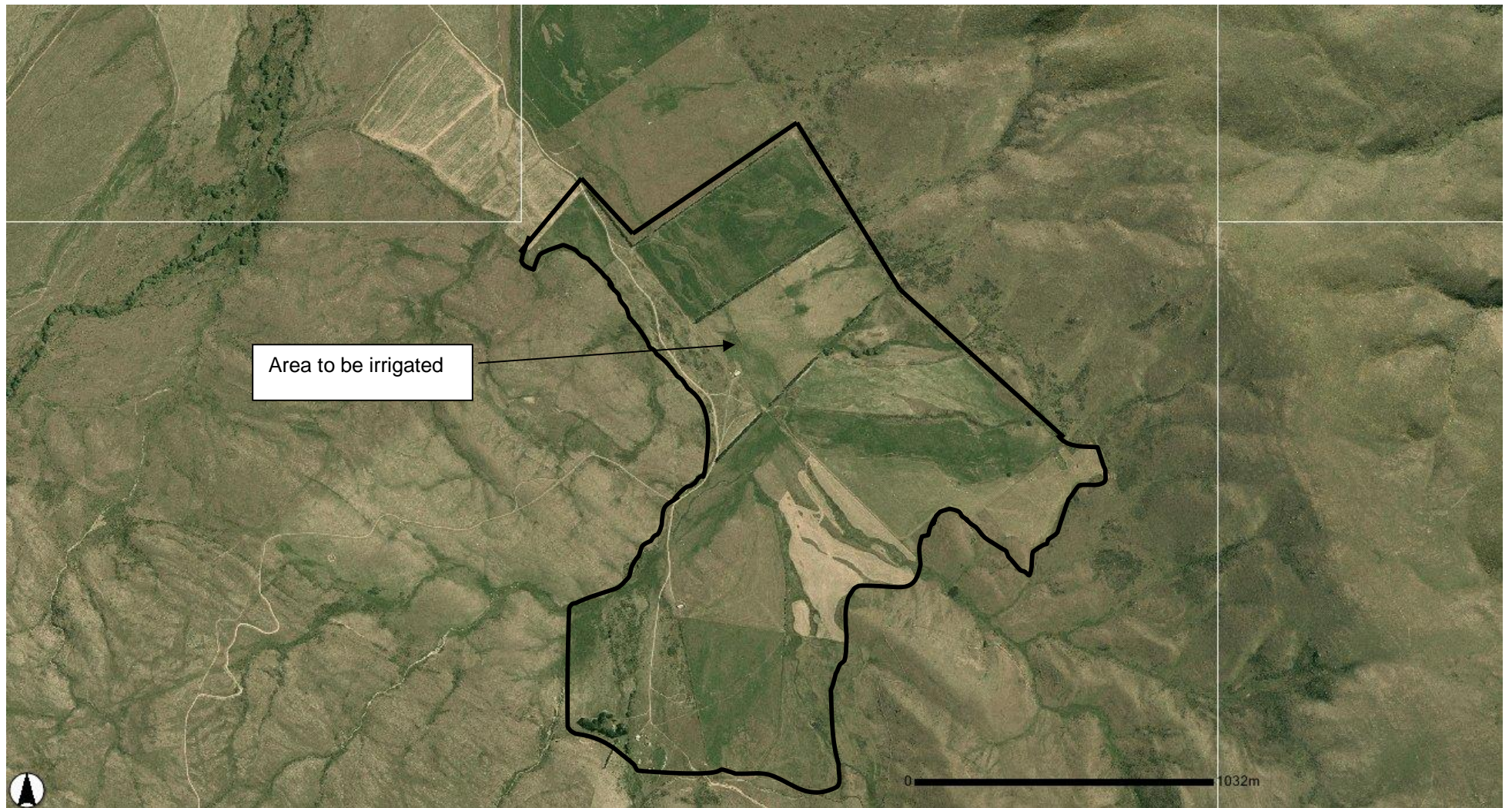
101. When water is discharged from one waterbody into another waterbody, the flow, and potentially the velocity, of the receiving waterbody is increased. When this occurs there is always the potential for increased erosion of the bed and banks of the receiving waterbody. We note that this discharges will be into Backyard Stream and the grassed depressions. The discharge from Glen Bouie Stream into Backyard Stream have occurred (pre 1999 when the necessary consents expired) for sometime without any erosion to be bed or banks of Backyard Stream.
102. Further the discharges from the storage ponds will be via purpose built spillways which will incorporate the necessary energy dissipation measure to avoid erosion of the grassed depressions. Given the effects of the proposed discharges are considered to be minor.

APPENDIX A – RELEVANT PLANS

CRC020355 – LAKE WAITAKI

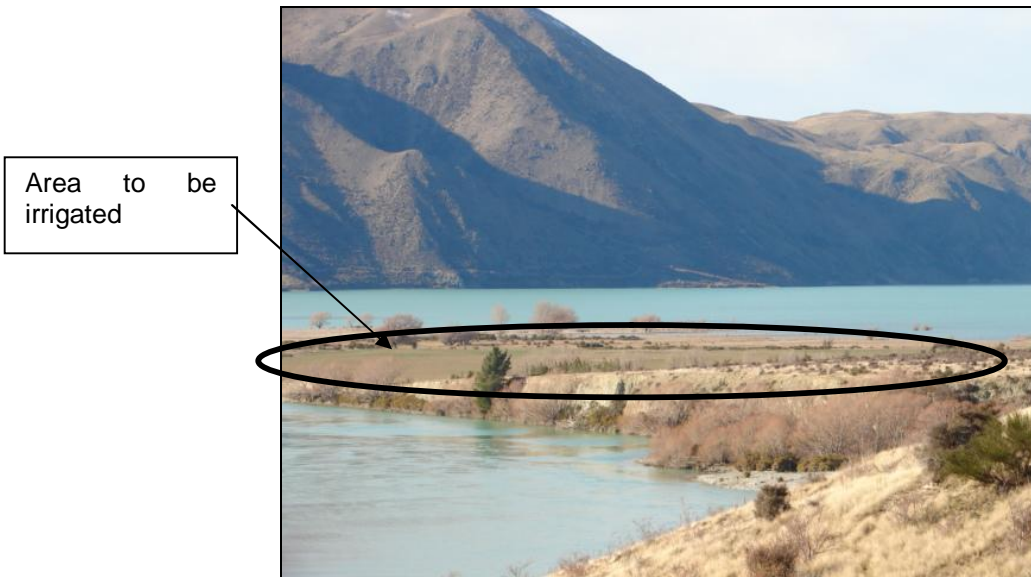


CRC041033 – GLEN BOUIE/BACKYARD STREAM



APPENDIX B - PHOTOS

Area to be irrigated – Lake Waitaki



Area to be irrigated – Glen Bouie Stream & Backyard Stream



General area to be irrigated

"Gully" to be dammed



Glen Bouie Stream – Looking upstream from existing intake



Existing Glen Bouie Stream Intake



**Glen Bouie Stream
flow**

APPENDIX C - PROPOSED CONDITIONS

CRC020355 – TO TAKE WATER FROM LAKE WAITAKI

No.	Condition Code ²	Details
Take		
1	WP01	<p>Name of waterbody: Lake Waitaki</p> <p>Map reference: NZMS 260 140:0150-1241</p> <p>Instantaneous rate: 35 litres per second</p> <p>Volume: 3,024 cubic metres per day and 203,408 2222,000 cubic metres between 1st July and the following 30th June</p>
Use		
2	WP04	<p>Type of irrigation: Spray irrigation</p> <p>Number of hectares: 37 35 hectares</p> <p>Use: crops and pasture for grazing stock excluding milking dairy cows</p> <p>Plan No: "CRC020355" (Attachment 1)</p>
3	WP05	Efficiency of use
4	WP06	Backflow preventer
Mitigation		
5		Abstraction shall cease whenever the lake level in Lake Waitaki is at or below 227 metres above mean sea level.
6		<p><u>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.</u></p> <p><u>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</u></p> <p><u>The fish screen shall be designed and installed in general accordance with <i>Fish Screening: good practice guidelines for Canterbury, NIWZ Client Report: CHC 2007. 092, October 2007</i></u></p> <p><u>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.</u></p> <p><u>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;</u></p> <p><u>The fish screen shall be maintained in good working order.</u></p> <p><u>Records shall be kept of all inspections and maintenance, and those records shall be provided to Environment Canterbury upon request.</u></p>
Measuring & Metering		
7	ME02	Piped
8	ME04	

² See Report 1, Appendix 6 for condition code and wording.

9	ME05	
10	ME06	
11	ME07	Waterway: Lake Waitaki
Administrative Conditions		
12	AD01	
13	AD02	<p>Number of working days: 5</p> <p>Month 1: March</p> <p>Month 2: July</p> <p>Waterbody: Lake Waitaki</p> <p>Cross reference to Condition: 5</p>
14	AD04	Lapse date

CRC041033 – GLEN BOUIE STREAM/ BACKYARD STREAM/ STORAGE POND

No.	Condition Code ³	Details
Divert		
1	WP01	<p>Name of waterbody: Glen Bouie Creek</p> <p>Map reference: NZMS 260 H40:792-084</p> <p>Instantaneous rate: 4,000 400 litres per second</p> <p>Volume: 86,400 34,560 cubic metres per day</p>
2	WP01	<p>Name of waterbody: Backyards Stream</p> <p>Map reference: NZMS 260 H40:799-157</p> <p>Instantaneous rate: 4,000 400 litres per second</p> <p>Volume: 86,400 34,560 cubic metres per day</p>
Take		
3	WP01	<p>Name of waterbody: storage dam</p> <p>Map reference: NZMS 260 H40:796-163</p> <p>Instantaneous rate: 75 litres per second</p> <p>Volume: 6,480 cubic metres per day and 660,000 cubic metres between 1st July and the following 30th June <u>If resource consent CRC041033 is used concurrently with resource consent CRC012017 the water may be taken at a rate not exceeding 75 litres per second, with a volume not exceeding 6,480 cubic metres per day and a volume of 1,179,820 cubic meters between 1st July and the flowing 30th June.</u></p>
Use		
4	WP04	<p>Type of irrigation: Spray irrigation</p> <p>Number of hectares: 120 hectares</p> <p>Use: crops and pasture for grazing stock excluding milking dairy cows</p> <p>Plan No: "CRC041033" (Attachment 1)</p>

³ See Report 1, Appendix 6 for condition code and condition wording.

5		The annual volume used over the 120 hectares, in conjunction with consent CRC012017 if granted, shall not exceed 660,000 -1,179,820 cubic metres.
6	WP05	Efficiency of use
7	WP06	Backflow preventer
Mitigation		
8	WP07	<p>Name of waterbody: Otamatapaio River</p> <p>Map reference: NZMS 260 H40:759-168</p> <p>Minimum flow: 200 litres per second</p> <p>Flow graph: See Report 2A Flow sharing regime as outlined by Mr Boraman.</p>
9	WP07	<p>Name of waterbody: Glen Bouie Creek</p> <p>Map reference: NZMS 260 H40:792-084</p> <p>Minimum flow: 10 litres per second</p> <p>Flow graph: See Report 2A</p>
10	WP09	<p><u>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.</u></p> <p><u>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</u></p> <p><u>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</u></p> <p><u>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.</u></p> <p><u>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;</u></p> <p><u>The fish screen shall be maintained in good working order.</u></p> <p><u>Records shall be kept of all inspections and maintenance, and those records shall be provided to Environment Canterbury upon request</u></p>
11		The consent holder shall ensure water races used to convey water diverted in terms of this permit are well maintained to minimise losses.
Measuring & Metering		
9	ME03	Open channel
10	ME04	
11	ME05	
12	ME06	
13	ME07	Waterway: Glen Bouie Creek
14	WP08	<p>Waterway: Glen Bouie</p> <p>Map reference: NZMS 260 H40:759-168</p> <p>To be used with ME03-05</p>
Administrative Conditions		
15	AD01	

16	AD02	<p>Number of working days: 5</p> <p>Month 1: March</p> <p>Month 2: July</p> <p>Waterbody: Glen Bouie Creek or Otamatapaio River</p> <p>Cross reference to Condition: 8 or 9</p>
17	AD04	Lapse date

CRC052739 – TO DISCHARGE WATER INTO WATER

No.	Consent Code ⁴	Details
Scope		
1	DP01	<p>Waterbody from: man-made water race</p> <p>Waterbody to: Backyards Stream</p> <p>Map reference: NZMS 260 H40:788-120</p> <p>Discharge rate: 4,000 400 litres per second</p> <p>Plan: "CRC041033"</p> <p>Other: The water shall by conveyance water and shall contain no contaminants.</p>
2	DP1	<p>Waterbody from: Backyards Stream</p> <p>Waterbody to: man-made water race</p> <p>Map reference: NZMS 260 H40:796-163</p> <p>Discharge rate: 4,000 400 litres per second</p> <p>Plan: "CRC041033"</p> <p>Other: The water shall by conveyance water and shall contain no contaminants.</p>
Operation and Maintenance		
3	DP02	Waterbody: Backyards Stream
4	DP03	
5	DP04	
Administrative Conditions		
6	AD03	Review
7	AD04	Lapse date

CRC052740 – TO DISTURB THE BEDS OF GLEN BOUIE CREEK AND BACKYARD STREAM

No.	Consent Code ⁵	Details
Scope		
1	LU01	<p>(a) Maintenance and installation of intake structures and discharge within beds of Glen Bouie Creek and Backyards Stream, including excavation of gravel and sediments,</p> <p>(b) To maintain adequate flow of water to irrigation intake,</p>
Location		

⁴ See Report 1, Appendix 6 for condition code and wording.

⁵ See Report 1, Appendix 6 for condition code and wording.

2	LU02	<p><i>Cross reference to Condition: 1</i></p> <p><i>Name of watercourse: Glen Bouie Creek and Backyards Stream</i></p> <p><i>Map reference: NZMS 260 H40:792-084 and NZMS 260 H40:799-157</i></p> <p><i>Plan: "CRC041033" (Attachment 1) and Attachment 3</i></p>
Limits of Excavation		
3	Non-standard	(a) Any gravel, sand and other natural material excavated as part of the works authorised by this consent during the disturbance of the bed of Glen Bouie Creek and Backyards Stream, must be deposited on, or near to, the excavation site, and shall be reshaped and formed to a state consistent with the surrounding natural riverbed
Erosion Protection		
4	LU10	
5	LU11	<i>Waterbody: Glen Bouie Creek and Backyards Stream</i>
6	LU12	
7	LU13	<i>Waterbody: Glen Bouie Creek and Backyards Stream</i>
Prior to Construction		
8	LU08	
9	Non standard	The Canterbury Regional Council Compliance Monitoring Officer shall be notified of the intention to carry out works and their intended type and scope at least 48 hours prior to the commencement of work.
10	LU31	Bird survey
During Construction		
11	LU14	
12	LU18	
13	LU21	
14	LU23 modified	All practicable measures shall be undertaken to minimise vehicles and machinery entering Glen Bouie Creek and Backyards Stream.
15	Non standard	Re-fuelling or storage of machinery or vehicles used for carrying out the work shall not occur in or near Glen Bouie Creek and Backyards Stream.
16	LU26	
17	LU24	
18	LU25	
Accidental Discovery Protocol		
19	LU09	
Upon Completion		
20	LU28	

21	Non standard	On completion of works, the area shall be restored to its original condition as far as practicable.
Administrative Conditions		
22	AD03	
23	AD04	

CRC052741 & CRC052742 – TO CONSTRUCT A DAM AND TO DAM UP TO 300,000 CUBIC METRES OF WATER

No.	Consent Code ⁶	Details
Scope		
1		Water shall only be dammed on land parcel Pt Run 743, at or about map reference NZMS 260 796-163, as shown on Plan CRCXXXXXX.
2		The volume of water dammed shall not exceed 300,000 cubic metres.
3		The depth of water in the dam shall not exceed 15 metres
4		The consent holder shall ensure that the freeboard is a minimum of 0.8 metres
5		The height of the crest shall not exceed 15 metres above natural ground level, as measured from the centre of the crest.
Construction		
6		Prior to the commencement of construction a copy of this resource consent shall be given to every person involved in the construction.
7		A construction report shall be prepared by the person responsible for the design of the dam, and a copy of which shall be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within one month of the construction of the dam.
8		Upon completion of the dam, and before first filling, the person responsible for the construction of the dam shall certify the dam as safe and ready for operation. A copy of the certification document shall be forwarded to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager.
9		(a) The [person responsible for the design and construction of the dam] shall be present during first filling and shall record any faults observed. (b) The consent holder shall immediately remedy any faults recorded during first filling. (c) A report shall be prepared detailing any faults observed and the remedial action taken, a copy of which shall be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within one month of first filling.
10		(a) The consent holder shall ensure that a chartered professional engineer inspects the dam within five days of first filling. (b) The chartered professional engineer shall record any faults or findings that could potentially lead to dam failure, and recommend the appropriate remedial works. A report of these findings and recommended remedial actions shall be prepared and a copy of which shall be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within one month of the inspection. (c) The consent holder shall immediately undertake any remedial works or corrective action recommended by the engineer and notify the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within one week of completion.
Operation and Maintenance		
11		(a) The consent holder shall undertake routine inspections and maintenance works on the dam. (b) The details and findings of any inspections and maintenance works shall be recorded in a logbook kept for that purpose. A copy of the logbook shall be forwarded to Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, by 30 June each year.
12		The consent holder shall ensure that the dam is inspected comprehensively by, or under the supervision of, a chartered professional engineer, yearly for the first [XXXX]

⁶ See Report 1, Appendix 6 for condition code and wording.

		years and then once every [XXXX] years after that. A copy of the inspection report shall be forwarded to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within one month of the inspection.
13		<p>In the event of any evidence of erosion, seepage, cracking, settlement, slipping or other embankment deformation the consent holder shall, immediately:</p> <ul style="list-style-type: none"> (a) Report the event to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager; and (b) Consult a chartered professional engineer who shall be requested to take responsibility for: <ul style="list-style-type: none"> (i) the inspection of the dam; (ii) the identification of remedial action required; (iii) the recording of the details of the inspection, reasons for the fault and remedial action required, in a report, a copy of which shall be forwarded to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within one month of the inspection. (c) Undertake any remedial works or corrective action recommended by the engineer, and notify the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within one week of completion.
14		In the event of dam failure, the consent holder shall immediately contact a chartered professional engineer who shall complete a report detailing the cause of failure and the action taken. A copy of this report shall be forwarded to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within one month of the event.

APPENDIX D – FARM MANAGEMETN PLAN

APPENDIX E – DAM BREACH ANALYSIS

APPENDIX F – CONSULTATION



"Keri Johnston"
<kerijohnston@irricon.co.nz>

24/09/2009 09:39 AM

To "Cathy Begley" <cathy.begley@ghd.co.nz>

cc "Lisa Anderson" <bogroy@farmside.co.nz>

bcc

Subject Otematata Station dam breach

Repository: 5125841 "RJ Hall Existing Contracts"

Hi Cathy

I have reviewed the dam breach assessment and spoken to Gundy and Lisa.

We can advise that we have no concerns with the proposed dam on Otematata Station.

Keri Johnston - Irricon Resource Solutions
Environmental Engineering Consultant
(BE(hons) Natural Resources; MIPENZ (environmental); CPEng)

Monday, Wednesday and Friday
P: (03) 3088 587 ext 2 M: (027) 220 2425 F: (03) 3039 786
E: kerijohnston@irricon.co.nz

Postal Address:
Tramway Road
RD1
Ashburton, 7771

This e-mail has been scanned for viruses by MessageLabs.

APPENDIX G – DEROGATION APPROVAL



meridian

17 March 2009

Gillian Ensor
Environment Canterbury
PO Box 345
Christchurch

Dear Gillian

Application by Otematata Station Limited

- 1 We write to you to outline the basis of Meridian Energy Limited (*Meridian*) providing its derogation approval to the application numbered CRC020355 by Otematata Station Limited (*OSL*). We refer to the letter to ECan from Chapman Tripp dated the 26th of June 2008 setting out Meridian's position on derogation approvals generally.
- 2 Meridian has read and considered the application CRC020355 by OSL and provides derogation approval on the following basis:
 - 2.1 OSL shall only be entitled to take and use water from Lake Waitaki (at location I40: 0150-1241) at a maximum rate of 35 litres per second for the spray irrigation of 37 hectares of crops, pasture and winter feed identified in the application;
 - 2.2 The annual volume shall not exceed 220,000 cubic metres per annum including a maximum volume of 18,500 cubic metres per ten day return period 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; and
 - 2.3 that the take of water cease when the level of Lake Waitaki reaches its minimum level of 227 metres a.m.s.l; and
 - 2.4 that the take is limited to an irrigation season between the 1st of September and the following 30th of April.
- 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 OSL application on the ground 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

A handwritten signature in black ink, appearing to be 'M. Roan', written over a horizontal line.

Mike Roan
Markets and Production Director



meridian

11 September 2009

Gillian Ensor
Environment Canterbury
PO Box 345
Christchurch

Dear Gillian

Application by Otematata Station Ltd

- 1 We write to you to outline the basis of Meridian Energy Limited (*Meridian*) providing its derogation approval of the application numbered CRC041033 by Otematata Station Ltd. We refer to the letter to Ecan from Chapman Tripp dated the 26th of June 2008 setting out Meridian's position on derogation approvals generally.
- 2 Meridian has read and considered the application CRC041033 by Otematata Station Ltd and provides derogation approval on the following basis:
 - 2.1 Otematata Station Ltd shall only be entitled to take or divert water from Glen Bouie Creek (at map reference NZMS H40:792-084) for the irrigation of 120 hectares identified in the application;
 - 2.2 Otematata Station Limited shall be entitled to dam up to 300,000 cubic metres of water in an unnamed tributary of Corbies Creek (at map reference NZMS H40: 796-163) and the maximum rate of take of 75 litres per second;
 - 2.3 The maximum daily volume shall not exceed 6,480 cubic metres per day and the maximum 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 The annual volume provided for in Clause 2.2 shall be time tranced in accordance with the following table:

Table A – Maximum Rates & Volumes for CRC041033

Year	Maximum rate of abstraction (litres/second)	Maximum Daily Volume (cubic metres/day)	Maximum Annual Volume (cubic meters/year)
1 September 2009 to 30 April 2010	0 l/s	0 m ³ /day	0 m ³ /annum
1 September 2010 to 30 April 2011	75 l/s	6,480 m ³ /day	180,000 m ³ /annum
1 September 2011 to 30 April 2012	75 l/s	6,480 m ³ /day	180,000 m ³ /annum
1 September 2012 to 30 April 2013	75 l/s	6,480 m ³ /day	180,000 m ³ /annum
1 September 2013 to 30 April 2014 and every year thereafter	75 l/s	6,480 m ³ /day	180,000 m ³ /annum

- 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 Otematata Station Ltd application on the ground 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



Mike Roan
Markets and Production Director



meridian

8 September 2008

Gillian Ensor
Environment Canterbury
PO Box 345
Christchurch

Dear Gillian

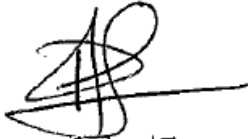
Application by Messrs KJ & DK & Mrs SR Anderson

- 1 We write to you to outline the basis of Meridian Energy Limited (*Meridian*) providing its derogation approval of the applications numbered CRC012017 and CRC012019 by Messrs KJ & DK & Mrs SR Anderson (*Messrs Anderson*). We refer to the letter to ECan from Chapman Tripp dated the 26th of June 2008 setting out Meridian's position on derogation approvals generally.
- 2 Meridian has read and considered the applications CRC012017 and CRC012019 by Messrs Anderson and provides derogation approval on the following basis:
 - 2.1 Messrs Anderson, Otematata Station Ltd and Messrs Munro shall only be entitled to divert, take and use water from Corbies Creek (at location H40: 786-173) at a maximum rate of 110 litres per second for the irrigation of 270 hectares and stockwater supply identified in the application;
 - 2.2 the annual volume shall not exceed 1,749,686 cubic metres per annum (of which 315,360 cubic metres per annum is stockwater) 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;
 - 2.3 Messrs Anderson shall only be entitled to divert, take and use from the Otamatapaio River (at location H40: 786-213) at a maximum rate of 110 litres per second for the irrigation of 105 hectares and stockwater supply identified in the application;
 - 2.4 the annual volume shall not exceed 1,820,016 cubic metres per annum (of which 315,360 cubic metres per annum is stockwater) 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 Messrs Anderson application on the ground 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

A handwritten signature in black ink, appearing to be 'Richard Turner', written over a horizontal line.

Richard Turner
Planning Manager – Natural Resources