

APPLICANT: GRAYS HILLS STATION LTD

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REPORT OF CATHY BEGLEY

Consent ID	Description	Table 3 Location	Table 5 Location
CRC042661	To take and use water from two galleries (I38/0057 and I38/0058) at a combined maximum rate of 100 litres per second for the irrigation of 190 ha ₂ of crops and pasture within a 1,500 ha ₂ area.	Grays River and Tributaries	Upstream of Waitaki Dam, but not upstream of the outlets of glacial lakes.
Activity Status			
<p><u>Rule 2, Table 3 WCWARP:</u> The take is within the allocation limit for Gray River₂; however, the applicant is proposing an alternative minimum flow regime that that contained within the WCWARP.</p> <p><u>Rule 6, Table 5 WCWARP:</u> The proposed annual volume is within the allocation limit for "Upstream of Waitaki Dam₂"; but not upstream of the outlets of the glacial lakes.</p> <p>Overall status: Any activity that does not comply with Rules 2 and 6 is a non-complying activity under Rule 16₂.</p>			

1 PROPOSAL

1. Grays Hills Partnership applied for CRC042661 on 2 June 2004. The consent was transferred to Grays Hills Station Ltd on the 15 March 2005 (hereon in referred to as "the applicant"). This application sought the ability to take up to 100 L/s from each of two proposed galleries to enable the irrigation of up to 384 ha₂ of crop and pasture within a larger 1,500 ha₂ command area. Following notification, the area of land to be irrigated has been significantly reduced from the original 384 ha₂ to 190 ha₂ of land within the 1,500 ha₂ command area and the rate of take has been reduced from ~~200 L/s~~ (i.e. ~~100 L/s~~ from each to two galleries) to ~~100 L/s~~ in total from both galleries.
2. The command area is shown on the plan contained in Appendix A.
3. The applicant subsequently applied for CRC052657 on ~~the~~ 5 March 2005 to install the two galleries (I38/0057 and I38/0058). This consent was granted in April ~~2005~~ and expired in April 2008 without either of the galleries being installed.
4. Gallery I38/0057 was to be located approximately 20-50 metres to the west of an unnamed man-made drain and approximately 500 ~~metres~~ to the west of the Grays River. Gallery I38/0058 was to be located approximately 20-50 ~~metres~~ to the south of an unnamed man-made drain, approximately 20-50 metres to the west of a second man-made drain and approximately 500 ~~metres~~ to the west of the Grays River. Both galleries ~~were~~ to be approximately 10 metres long and 5 metres wide. It runs in a north-south direction parallel to the man-made drain.
5. I note that Ms Penman has stated that the galleries are to be located within the bed of the man-made drains. While it is acknowledged that ~~in~~ the application as lodged ~~originally~~ sought this, in 2005 the application was ~~amended~~ to take water from two ~~galleries located~~ outside the bed of the river. Hence the requirement ~~to~~ gain a bore permit to install these galleries. The applicant still ~~proposes~~ to take water from galleries located outside the bed of these man-made drains, not as Ms Penman states ~~from~~ galleries within these drains.

1.1 Timeline and Summary of Amendments made to the Applications

Timeline	CRC042661
Date of Lodging	2 June 2004
Notifiable Date	15 March 2005
Public Notification	4 August 2007

6. As outlined above the application to take and use water was lodged in June 2004. Between February 2005 and November 2009 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 bore permits to install the galleries in 2005 along with providing further information on the following matters:

- Providing an ~~alternative~~~~iterative~~ minimum ~~flow~~~~flows~~ for the Grays River;
- ~~Annual~~~~An annual~~ volumes for the proposed take;
- 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 ~~stock water~~; ~~stockwater~~;
- Providing derogation approval from Meridian Energy Ltd.

1.2 Water Source

7. The applicant seeks to take water from the Grays River which is located on the eastern fringe of the Tekapo Basin and drains the western slopes of the Grampians, Dalgety, Rollesby and Two Thumb ranges. The river discharges into the Tekapo River approximately 19.5 km_u upstream of Lake Benmore.

8. I note that F & G's submission highlights the fact that the Grays River is an important brown and rainbow trout habitat and ~~support~~~~support~~ a good trout population. Over the years recreational anglers have increasingly ~~valued~~~~value~~ the river system. Further, the Grays River also provides important habitat and breeding areas for populations of ~~game birds~~~~gamebirds~~ such as the gray duck, mallard duck and Canada geese.

2 BACKGROUND INFORMATION

2.1 Farm Details

9. The applicant operates a 21,900 ha_u property on Haldon Road north of Lake Benmore, of which half the property is freehold with the remaining half of the property being pastoral lease.

10. Irrigation of the 190 ha_u is a very important step for the applicant to ensure that they are able to continue to farm the leasehold area in the long-term. Having irrigation also provides the applicant some options prior to entering tenure review. While the outcome of the tenure review process is unknown, it is possible that as a result of the tenure review process the area able to be farmed is significantly reduced (potentially halved). With irrigation the applicant will be able to maintain the 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.

11. The land to be irrigated by this consent is part of the 10,720 ha_u ~~leasehold~~~~lease hold~~ block, which is totally flat and is bounded to the east by Gray's River and to the west by the Tekapo River. The majority of the area is low producing old river flats, with the exceptions of the margins of the Grays River which is a higher producing area. Currently this area has an upper stocking rate limit of 250 cows and 3,600 sheep.

12. In general the soils in this area are very light and easily eroded by wind, thus cropping large areas of land ~~(in its current state)~~ has to be undertaken with extreme care. It also means that this area is under constant threat from weed and pest species. One such pest species is rabbits, which can cause significant destruction ~~to~~ pasture. When pasture destruction is combined with regular nor-west winds, significant soil erosion can result. This means that this area really needs to be looked after or it will continue to erode. While it is recognised that ~~the~~ irrigation proposed cannot fix the whole area, it will ~~definitely~~ be of significant benefit to the 190 ha, directly, and then indirectly to the surrounding area. This will be through increased weed and pest control, which ~~is~~ currently uneconomic to undertake on this area.
13. The applicant anticipates that two thirds of the area (around 120 ha, of the 190 ha, area) irrigated will be planted in Lucerne, which will be primarily used to provide winter feed, but also provide some lamb grazing options in ~~the post~~-Christmas period. The reasons for ~~planting~~ Lucerne ~~are~~ is that it grows well over summer growth and less during winter. The low growth rates in winter means that it is well suited to areas that experience "hard" winters, such as the Mackenzie Basin. It also has very deep roots, which means that it is able to access and have a higher uptake of minerals and nutrients within the soils. ~~These result~~ ~~This results~~ in less fertilizer, such as nitrogen, being applied to maintain growth rates with consequently less fertilizer leaching (or being lost from the system). Another advantage of Lucerne is that at times of ~~surplus~~ it can be sold or put into storage and used in times of drought.
14. The applicant anticipates that the remaining third (around 70 ha,)) will be planted in either oats or pasture for Lucerne renewal. While Lucerne has a long life (up to 15 years), there needs to be some form of rotation in place so that the soil has a break from being in Lucerne. Planting oats also offers some flexibility in how and when it is used. The grain produced can be used for winter-feed or sale off farm if there is surplus, along with the option of using oats in baleage and/or grazing.
15. Allowing the 190 ha, to be irrigated will ~~mean~~ 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~~ ~~variably~~ in seasons. This ~~variability~~ ~~variably~~ 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.
 - 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.
16. As outlined above, ~~pasture~~ ~~pasutre~~ destruction along with regular and prolonged nor-west winds can result in significant soil erosion. Soil erosion under the area irrigated is likely to be significantly reduced. This is due to the way in which the area is to be managed. The applicant is fully ~~conversant~~ ~~converse~~ in how important soils are and believes that limited ~~cultivation~~ ~~cultivation~~ combined with irrigation, ~~would mean~~ good lucerne stands ~~would be possible~~. ~~This are possible~~ ~~which~~ in ~~turn~~ ~~trun~~ will significantly ~~reduced~~ ~~reced~~ wind-borne ~~borne~~ ~~bourm~~ soil erosion. While the soils will require some inputs, such as lime, sulphur and some nitrogen and ~~phosphorus~~ ~~phospourous~~, once the levels of these nutrients have reached the optimum ~~levels~~ ~~levles~~, the addition of such nutrients will be limited to that required to ~~maintain~~ ~~maintian~~ them at these levels.
17. The value of irrigation for the applicant is in having available a source of consistently high quality feed available to them. This is because the quality of the feed able to be produced on-site sets the platform for the whole ~~year~~ ~~years~~, and ~~potentially~~ ~~thepotently~~ following year's production. Enabling the applicant to finish lambs born on farm also gives much higher financial rewards with minimal costs when compared to having to sell stock, usually at lower returns. Additional benefits to the

applicant also include possible genetic gains. This is as a result of the applicant being able to keep replacement stock until they are 12 months old. At this stage culling of replacements can be ~~undertaken~~ ~~undertaking~~ with a higher degree of accuracy than when these stock are younger.

18. There is ~~a~~ also significant financial value in enabling the applicant to keep their own breeding stock (both lambs and calves). This is due to the fact that there will ~~not~~ be ~~any~~ "down time" as replacement stock brought ~~onto on to~~ the property ~~adjusts~~ ~~adjust~~ to ~~it~~ ~~the~~ ~~property~~, nor ~~are~~ ~~is~~ there the costs associated with cartage and ~~agents'~~ ~~agents~~ fees. Currently the applicant is only able to keep 60-65% of the lambs born through to 12 months. Under irrigation it is hoped that up to 100-% of lambs can be finished on ~~_~~ farm without the risk of running out of winter feed as this feed has been used to finish lambs.

2.2 ~~Mackenzie~~ ~~McKenzie~~ Irrigation Company Shares held

Name: Grays Hills Station Ltd	Number
Property Shares	1
Name: Mark Urquhart Uquhart & Sherie Whelan	
Irrigation Shares	480 (of which 190 are for this application)

19. Irrigation shares are required for the area to be irrigated as this consent is a new consent.

2.3 Derogation Approval

20. Derogation approval was obtained in standard format from Meridian Energy Limited on 10 September 2009

3 COMMENTS ON SUBMISSIONS

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

Resource Consent	Submissions in support	Submission in opposition	Neutral
CRC072363	3	16	2

22. 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.

23. Details of the submissions received made individually on these 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

Submitter	Issues	Support/neutral/oppose
Central South Island Fish and Game Council	The submitter has highlighted the fact that the Gray River is an important habitat for both Rainbow and Brown Trout, along with game birds, resulting in the river being valued by both anglers and game bird shooters. The submitter would like to ensure that any takes from the Gray River do not impact upon these habitats.	Oppose

24. With ~~respect~~ to the LINZ submission, the ~~applicant~~ ~~appliant~~ has gained consent of LINZ to cultivate up to 400 ha of ~~pastoral~~ ~~pastreal~~ lease land, with the ~~irrigation~~ ~~irrigaiton~~ of cultivated ~~pastoral lease~~ ~~pastural lease~~ land being a permitted activity. Thus no further consents from LINZ are required.
25. As outlined above, Meridian Energy Ltd ~~has~~ ~~have~~ provided derogation approval. ~~The and due to the fact that the~~ applicant ~~holds~~ ~~does hold~~ sufficient MIC Shares to irrigate the 190 ha of land. Further the applicant is proposing that the take be metered in accordance with the WCWARP. ~~Issues with~~ ~~With respect whether the take will impact upon~~ water quality ~~are, this aspect is~~ addressed in section 4.4 of this evidence.
26. With respect to F & G's submission, the applicant is proposing an alternative minimum flow regime of 1,500 L/s to be measured at Days Bridge. F & G have agreed that the proposed alternative minimum flow is appropriate.
27. I note that Ms Penman has stated in her report that Otamatapaio Station 1993 Ltd submitted in opposition to this application. Unfortunately, I am unable to find any such submission.

4 CRC042661 – TO TAKE AND USE WATER - ASSESSMENT OF ENVIRONMENTAL EFFECTS

4.1 Effects on other water users

Effects on other water users	
Comments	Galleries I38/0057 and I38/0058 are classified as being highly connected shallow groundwater. The CRC reporting officer for these applications agrees that effects on other water users are minor provided .

28. There are no bores or galleries within a 2 km radius of the applicant's proposed galleries. Therefore the proposed take from these galleries will not impact upon any other groundwater user.
29. To determine the level of hydraulic connection between the galleries and the man-made drain, I have undertaken a stream depletion model. This model is used when assessing the stream depletion effect (or level of hydraulic connection). To undertake this model I have used the following assumptions:
- A storativity value (or the ability ~~of~~ the aquifer to store water) of 0.1 has been used. This assumes that the galleries are located within an unconfined shallow aquifer system.
 - A ~~transmissivity~~ ~~transmisivitiy~~ value (or the ability of water to flow through the aquifer) of 500m²/day has been used. This value has been used as a default value due to the fact that there are no specific capacity values within a 2 km radius of the applicant's galleries. This value is considered to be a conservative default figure.
30. The stream depletion model (attached in Appendix B) shows that the galleries have a high connection to the unnamed drains, and as such may impact upon the flows contained not only within the man-made drains but ~~within~~ ~~also~~ the Grays River ~~also~~. This is due to the fact that the unnamed

drains flow into the Grays River. We are unaware of any other surface water abstractors from the man-made drains. This is due to the fact that the land through which these drains flow (from their source to the Grays River) is controlled by the applicant. Given this, the take from the galleries will not impact upon any other water user or person ~~whom~~ relies upon these man-made drains for other purposes such as domestic and stock water.

31. However, in saying this, it is recognised that the Grays River is a spring fed river, and as such relies upon inflow from the shallow groundwater. Thus there is the potential for the proposed take to impact upon any other user of the Grays River. I note that the Grampians Station (Mr AN Hope) proposes to take surface water from the Grays River both downstream and upstream of where the two man-made ~~drains~~ meet the Grays River.
32. Table 3 of the WCWARP provides an overall allocation limit for the Grays River of 0.5m³/s. This allocation limit aims to, ~~amongst~~ other things, ensure that where there are competing users for the resource, the effects on these users ~~are~~ "acceptable". Should all the applications be granted, including Mr AN Hope's application, the total allocation for the river will be 0.35m³/s, which is well within the overall allocation limit for the Grays River.
33. While these applications may be within the overall allocation limit for the Grays River, there is always the potential that the two competing users could impact upon each other. To ensure that the two competing users do not impact upon each other, a water users group is to be established.
34. 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 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 ~~metres~~ per year ~~being~~ exceeded.
35. Further, 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 ~~in-stream~~ values

Minimum flow requirements	
	Proposed Environmental Flow Regime
Comments	<p>A minimum flow of 1,500L/s as measured at Days Bridge is proposed.</p> <p>The CRC reporting officer considers the effects to be uncertain and as such they may be more than minor.</p>

36. Table 3 row (xxiii) of the WCWARP ~~establishes~~ that for connected groundwater the minimum flow regime of the relevant surface ~~water body applies~~. In this particular instance the relevant surface water way is the Grays River. Table 3 row (v) states that a minimum flow of 1.8m³/s is appropriate. This minimum flow is to be measured at Days Bridge. The minimum flow, along with the allocation regime, aim to ensure that not only the aquatic values of Grays Stream ~~are~~ protected, but also the aquatic values of the lower Tekapo River are protected. This is because the Grays River, along with a number of other waterways, is one of the main sources of water in the lower Tekapo River.
37. In the application originally lodged with the CRC, the applicant proposed an alternative minimum flow regime based upon the Forks Stream, as they were of the opinion that the minimum flow for the Grays River of 1.8m³/s was too high.
38. As outlined in Mr de ~~Joux's~~ evidence, it would appear that the hydrological information provided to the Board, which was used to determine the minimum flow, was based upon historical hydrological information and failed to take into account the reduction in flow in the Grays River as a result of the diversion of the Tekapo River. Based upon recent gaugings it would appear that the diversion of the Tekapo River has resulted in a reduction in the flow of the Gray River at Days Bridge. To this end, an alternative minimum flow of 1,500L/s is proposed. This minimum flow is to

be monitored at Days Bridge. I understand that both Mr ~~Stewart~~Sewart (CRC hydrologist) and Mr Scarf (F & G and DoC hydrologist) agree that 1,500L/s is acceptable.

39. I also note that Ms Penman states (paragraph 44) that she is unable to determine the degree of effect of the proposed minimum flow. By this I assume that Ms Penman is alluding to whether the alternative minimum flow will protect the ~~in-stream~~instream values of the Grays River. This assessment appears to be in contradiction to her paragraph 96, where she states that the proposed alternative minimum flow will protect the values and matters set out within Policy 4 of the WCWARP. I note that aquatic ecosystems ~~are~~is one of the values that Policy 4 aims to protect. Given that the alternative minimum flow is not contrary to Policy 4, logically, one would assume, that the proposed minimum flow should also provide adequate protection to the ~~in-stream~~instream values associated with the Grays River.
40. I also note that Ms Penman in *Attachment 4 of Report 2A – Environmental flow and level regimes – Overview report* recommends a minimum flow of 1,500L/s and a flow sharing regime for the ~~Grays~~Gray's River whenever the flow in the river is between 2,000L/s and 1,500L/s. Ms Penman states that the reasons for the flow sharing ~~are~~is to "...ensure that the minimum flow will be retained at the downstream end of the catchment as far as possible..." (Page 21). In this particular situation, Days Bridge (the minimum flow monitoring point) is located downstream of all abstraction subject to this hearing as required by the WCWARP. Therefore the flow sharing recommended by Ms Penman is unnecessary to ensure that the minimum flow, at the downstream end of the catchment is maintained.

4.3 Effects of inefficient water use

Reasonable and Efficient Use Seasonal Volumes and Land Use	
Land Use	Intensive mixed (Cropping, Sheep and Beef)
Area to be irrigated (hectares)	190 ha (within a command area of 1,500 ha)
Method of application	Spray
Efficiency of application	80%
Daily application depth	4.5 mm
Return period	3-7 days
Return period application depth	13.6 – 31.5 mm
Soil profile available water	35 % (66.5 ha) Heavy soils 15 % (28.5 ha) Medium soils 50 % (95 ha) Light soils
Effective Irrigation Season Rainfall	175 mm/ha/yr
Assessment criteria (based on)	Policy 10-14 (WCWARP)
Seasonal volume required (m ³ /year)	1,140,000 m ³ /year
Seasonal volume - Schedule WQN9v2 (m ³ /year)	1,129,800 m ³ /year
Seasonal volume - Irrical	1,190,512 m ³ /year

Volume to be included in Table 5 (WCWARP) allocation	1,140,000 m 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 1,129,800 m ³ /year, which is less than that proposed. However, however , the Irrical annual volume is 1,190,512 m ³ /year, which is more than the proposed annual volume.

41. 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 ~~is by through~~ the implementation of an annual volume using one of the two methods set out in Policy 16-(c) of the WCWARP.
42. The applicant will be applying no more than between 13.6 mm and 31.5 mm per 3 - 7 days, which is no more than half of the average water holding capacity of the soil, and as such is considered to be an efficient use of water.
43. This application proposes an annual volume of 1,140,000m³/year, which is based ~~on upon~~ the ~~applicant's applicants~~ MIC shareholding. I note that Ms Penman has stated that, using the methodology set out in Policy 16-(c)(i)-(ii), an annual volume of 811,300 m³/year would be acceptable. Unfortunately, I am unable to agree with this annual volume. I note that Ms Penman ~~agrees agrees~~ that the effective rainfall for the area is 175 mm/year. Using the same soil profiles set out above (which are the same as those Ms Penman has used) I have determined that an annual volume of 1,129,800m³/year would be appropriate. This is substantially more than Ms Penman is proposing. However, even saying this, the annual volume determined is less than that proposed. I note that Policy 16-(c)(i) also sets an alternative methodology for determining annual volumes. I note that Irrical is considered to comply with this policy and, using this methodology, an annual volume of 1,190,512 m³/year would be acceptable.
44. As the proposed annual volume is less than the annual volume determined using the methodology set out under Policy 16-(c)(i)-(ii), the use of water is considered to be efficient.
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.
46. It is noted that the applicant also holds CRC0022037, for the irrigation of 290 ha. As shown on the plan contained in Appendix A the area irrigated pursuant to this water permit is located some 10 km, to the south of the area proposed to be irrigated under this application. Therefore, there it is not possible for the two irrigation areas to overlap.

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 one 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>

47. 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.
48. 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.

49. 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 ~~into~~ into the table below. This table shows that the applicant can meet the property thresholds which are the most restrictive.

	Nitrogen Threshold	Phosphorus Phosphorous Threshold
MWRL Water Quality Study Property Thresholds	64,114	1,374
OVERSEER® outputs	48,369	1,010

50. The applicant is committed to implementing the “Mandatory Good Agricultural Practices” set out within the Farm Environmental Management Plan (FEMP) (see Appendix E). Implementing these practices ensure that the OVERSEER® results are validated. This along with ensuring that the property thresholds of the WQS (set out in the table above) are not exceeded will ensure that the cumulative effects of the use of water for irrigation on water quality are no more than minor.
51. 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 E).
52. At a workshop held in Twizel in August 2009, the applicants met with Ms Melissa Robson of GHD Limited. A ~~desktop~~ on-farm risk assessment was undertaken. This is considered to be the “starting point” of the FEMP.
53. 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.
54. For Grays Hills Station, the desktop risk assessment identified the following potential risks:
- 43.1 The large number of surface water bodies that flow through the property;
 - 43.2 Extensive tracking; ~~and~~
 - 43.3 Use of full cultivation; ~~;~~
55. 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 E).
56. Given that the N and P thresholds from the MWRL Study can be met, and the ~~applicant's~~ applicant's 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>

57. 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 to be irrigated is located 10 km₂ to the east (across the Tekapo River) from the Tekapo Twizel Road (SH 8) and 13 km₂ to the south of the Fairlie Fairlie Tekapo Road (SH 8). Further, it is located 2.1 km₂ to the west of both Haldon Road and the Hakataramea Pass Road.

58. 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 are considered to be minor.

4.6 Effect from cross-connection on groundwater quality

59. The galleries are to be located within the shallow unconfined aquifer system and approximately 10 metres in depth. This means that cross connection between the aquifer from which the applicant is abstracting from a deeper aquifers is unlikely.

60.

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4.7 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

61-59. 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.

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62-60. It is acknowledged that Te Runanga O Ngai Tahu ~~has~~ 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.

4.8 Effects on People, Communities and Amenity Values

Effects on People, Communities and Amenity	
Comments	The CRC reporting officer for these applications considers there may be effects on people and communities of may be more than a minor nature .

63-61. 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, ~~communities~~ community and amenity values within the rivers specific to each applicant.

64-62. 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.

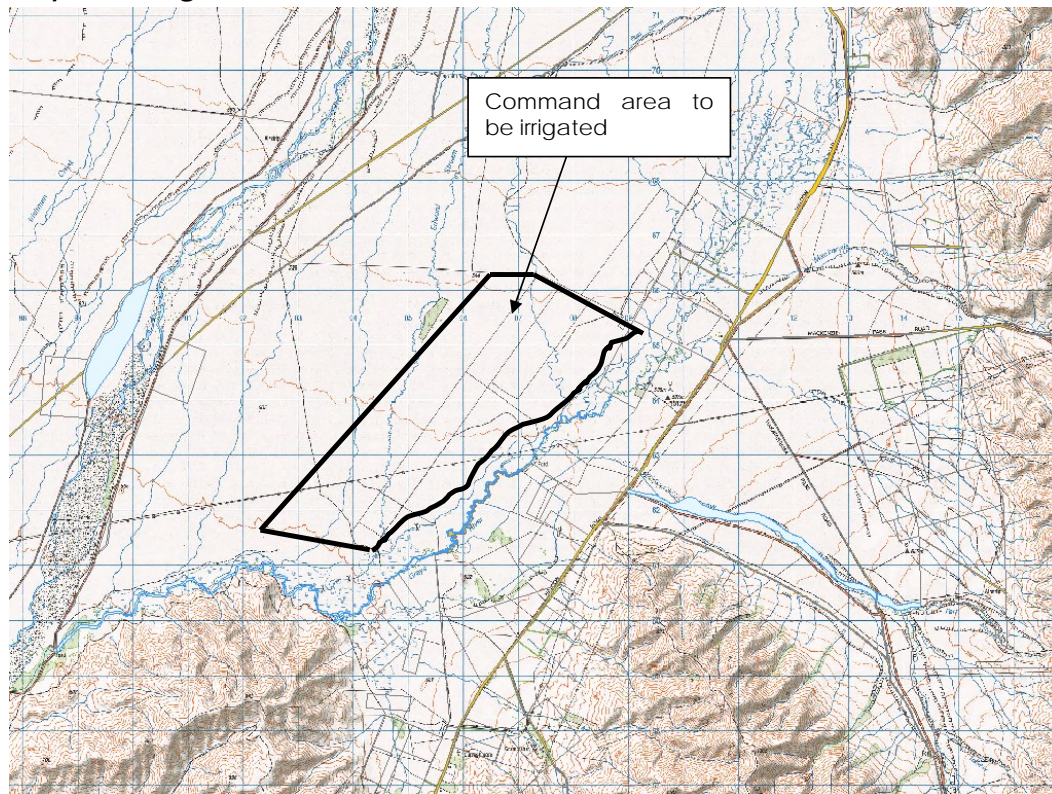
65-63. The WCWARP sets an annual allocation "cap" for agricultural and horticultural activities within defined areas (Table 5). The applicant has proposed an annual allocation limit for their own resource consents for the use of water, as well as implementing Farm Management Plans, which require existing 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.

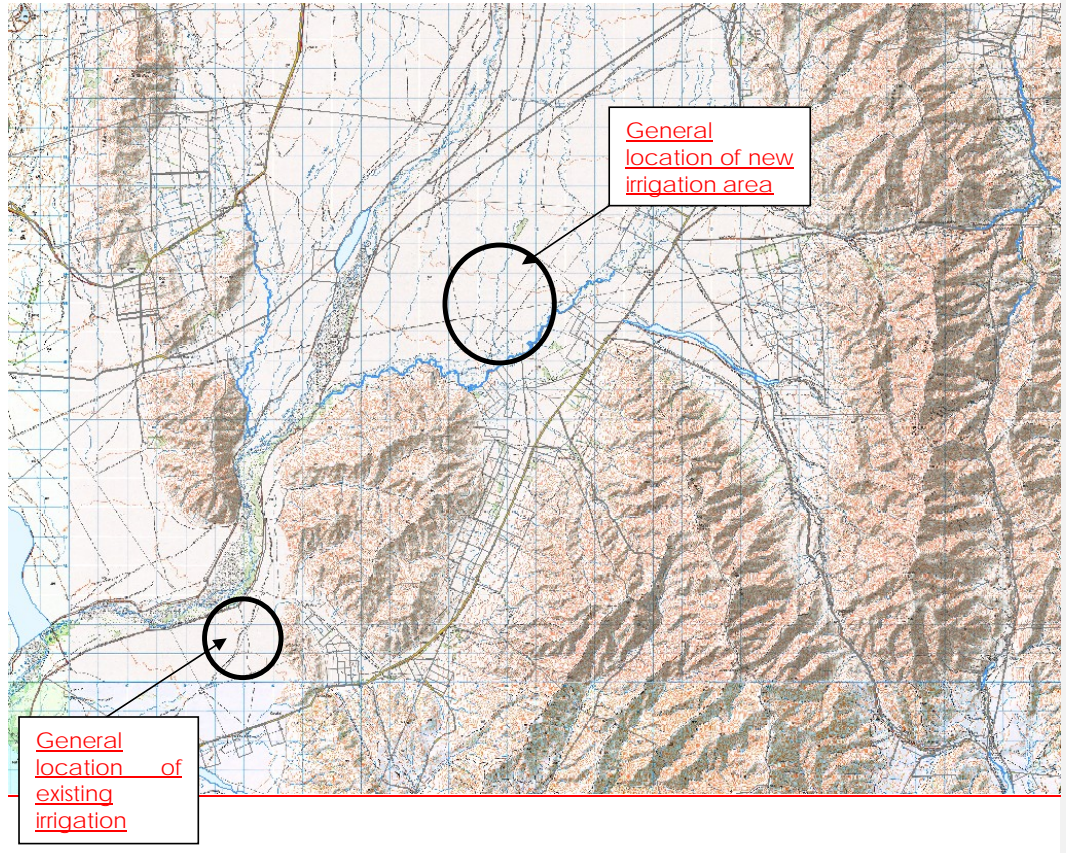
- | ~~66-64~~. The primary objective of an annual allocation is to ensure that the water is used efficiently and effectively for the land use, soil type and climatic conditions. The applicant has proposed an annual volume that is considered to reflect reasonable and actual use and this is within the allocation limit defined by Table 5.
- | ~~67-65~~. 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.

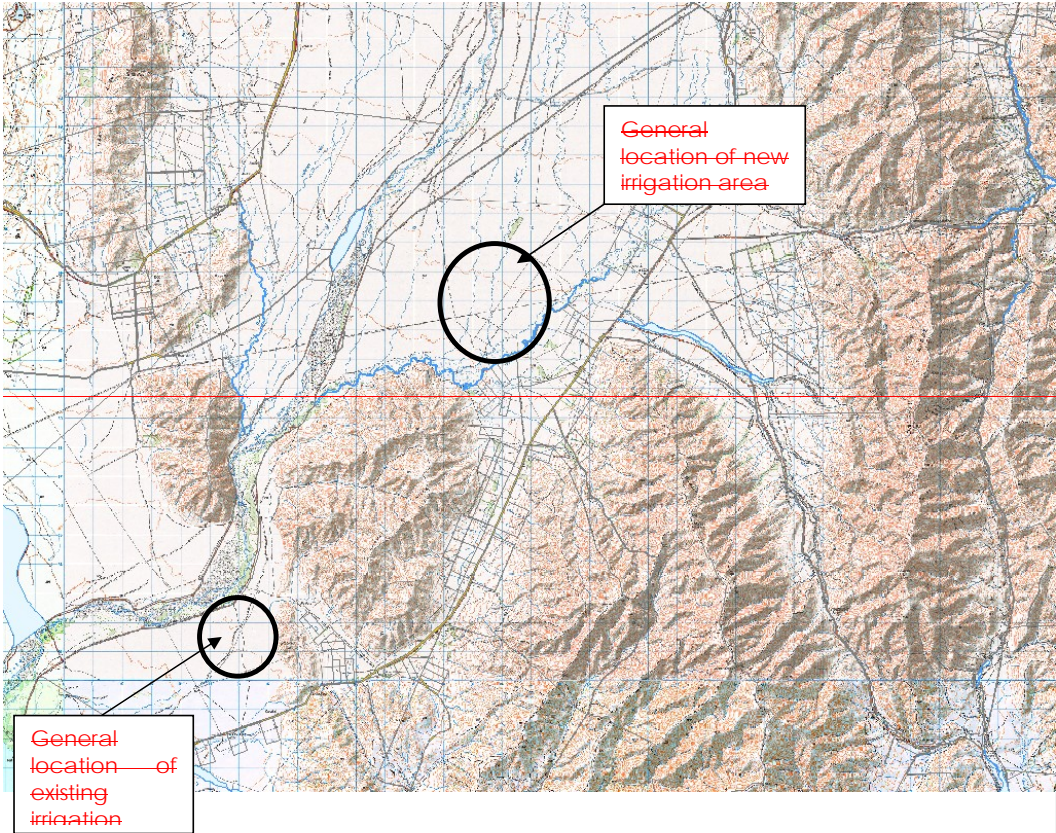
APPENDIX A: RELEVANT PLANS

Proposed Irrigation area



Proposed irrigation areas in relation to existing irrigation area



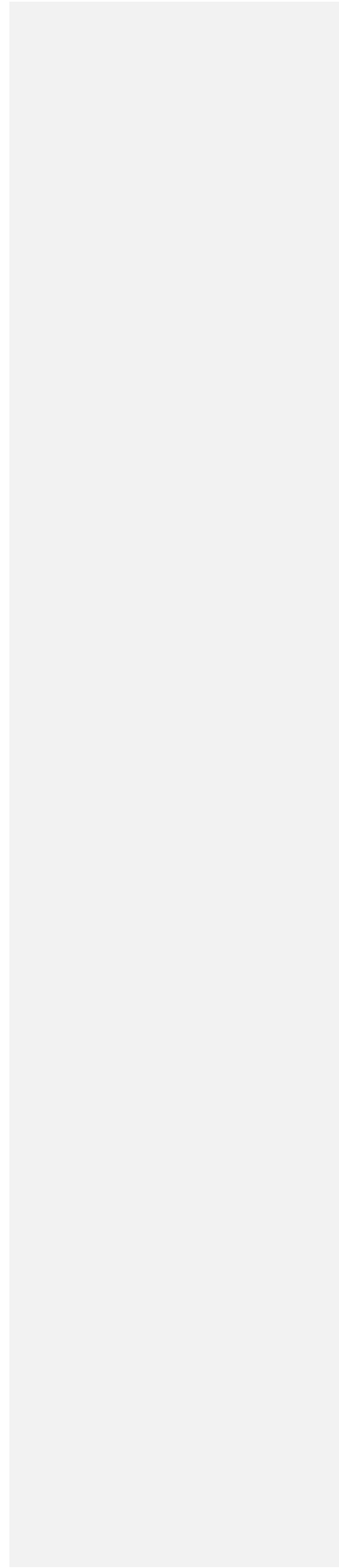


General location of new irrigation area

General location of existing irrigation

APPENDIX B: STREAM DEPLETION MODEL

|



APPENDIX C: PHOTOS

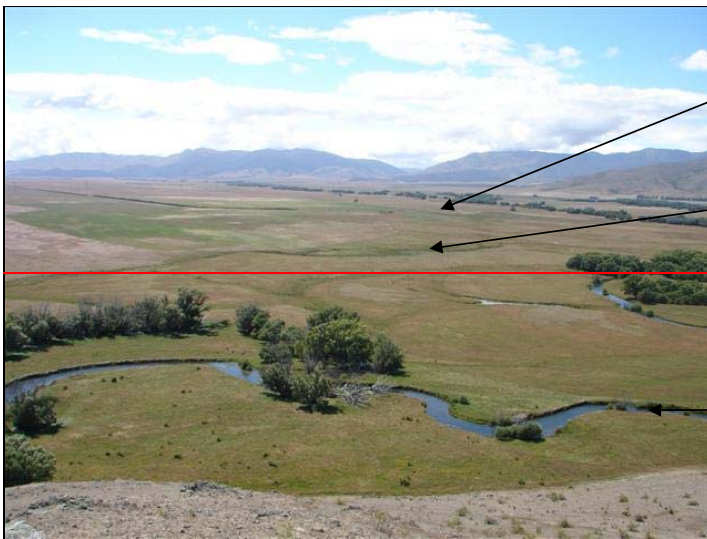
Area to be irrigated



General location of irrigation area

Man-Made

Gray River



General location of irrigation area

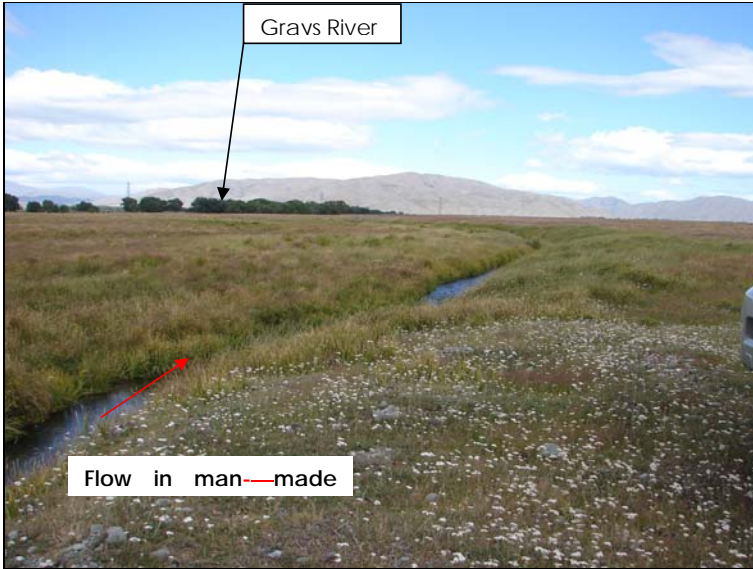
Man-Made

Gray River

Area to be irrigated. Looking towards the Tekapo River.



Man-Made Drain



Grays River at Days Bridge – Looking upstream



APPENDIX D: PROPOSED CONDITIONS

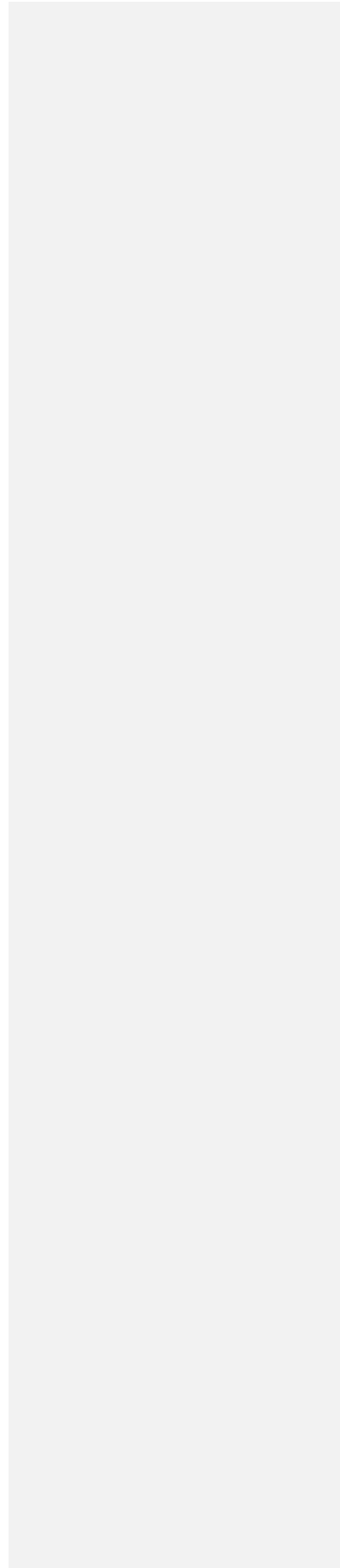
<u>Duration</u>																										
<u>1</u>		Consent is granted for a term expiring on the 30 th of April 2025. <i>Clause 15.3(a)</i>																								
<u>Take</u>																										
<u>12</u>	WP01	<p><i>Name of waterbody:</i> Grays River</p> <p><i>Map reference:</i> NZMS 260 138-0500-6170 and 138-0810-6420</p> <p><i>Gallery:</i> 138/0057 and 138/0058</p> <p><i>Instantaneous rate:</i> 100 litres per second</p> <p><i>Volume:</i> 811,300 cubic metres Water may only be taken and / or diverted from galleries 138/0057 and 138/0058 located at or about map reference NZMS 138:050-617 and NZMS 138: 081-642. <i>Clause 15.3(d)</i></p>																								
<u>32</u>	WP04	<p>Water may only be taken between 1 September and the following 30 April and only in accordance with the maximum rate, daily volume (being from 12.01am to 11.59pm) and annual volume (measured between 1 July and the following 30 June) set out in Table A. <i>Clause 15.3(d)</i></p> <p style="text-align: center;">Table A – Maximum Rates & Volumes</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="text-align: center;">Year</th> <th style="text-align: center;">Maximum rate of abstraction (litres / second)</th> <th style="text-align: center;">Maximum Daily Volume (cubic metres / day)</th> <th style="text-align: center;">Maximum Annual Volume (cubic metres / year)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1 September 2009 to 30 April 2010</td> <td style="text-align: center;">100 l/s</td> <td style="text-align: center;">8,640m³/day</td> <td style="text-align: center;">1,140,000 m³/annum</td> </tr> <tr> <td style="text-align: center;">1 September 2010 to 30 April 2011</td> <td style="text-align: center;">100 l/s</td> <td style="text-align: center;">8,640m³/day</td> <td style="text-align: center;">1,140,000 m³/annum</td> </tr> <tr> <td style="text-align: center;">1 September 2011 to 30 April 2012</td> <td style="text-align: center;">100 l/s</td> <td style="text-align: center;">8,640m³/day</td> <td style="text-align: center;">1,140,000 m³/annum</td> </tr> <tr> <td style="text-align: center;">1 September 2012 to 30 April 2013</td> <td style="text-align: center;">100 l/s</td> <td style="text-align: center;">8,640m³/day</td> <td style="text-align: center;">1,140,000 m³/annum</td> </tr> <tr> <td style="text-align: center;">1 September 2013 to 30 April 2014 and every year thereafter</td> <td style="text-align: center;">100 l/s</td> <td style="text-align: center;">8,640m³/day</td> <td style="text-align: center;">1,140,000 m³/annum</td> </tr> </tbody> </table> <p><i>Instantaneous rate:</i> 100 litres per second</p> <p><i>Volume:</i> 811,300</p> <p><i>Type of irrigation:</i> Spray irrigation</p> <p><i>Number of hectares:</i> 190 hectares</p> <p><i>Use:</i> crops and pasture for grazing stock excluding milking dairy cows</p> <p><i>Plan No:</i> "CRC042661" (Attachment 1)</p>	Year	Maximum rate of abstraction (litres / second)	Maximum Daily Volume (cubic metres / day)	Maximum Annual Volume (cubic metres / year)	1 September 2009 to 30 April 2010	100 l/s	8,640m ³ /day	1,140,000 m ³ /annum	1 September 2010 to 30 April 2011	100 l/s	8,640m ³ /day	1,140,000 m ³ /annum	1 September 2011 to 30 April 2012	100 l/s	8,640m ³ /day	1,140,000 m ³ /annum	1 September 2012 to 30 April 2013	100 l/s	8,640m ³ /day	1,140,000 m ³ /annum	1 September 2013 to 30 April 2014 and every year thereafter	100 l/s	8,640m ³ /day	1,140,000 m ³ /annum
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<u>Use</u>																										
<u>4</u>		Water allocated in Table A of Condition (3) shall be used only for the spray irrigation of for grazing sheep and beef cattle to irrigate 190 hectares on the area of land shown on attached Plan A. <i>Clauses 15.3(d) & 14(3)</i>																								
<u>5</u>		Water for irrigation shall only be used on or applied to land that is subject to a memorandum of encumbrance that complies with the requirements of the agreement entitled "Agreement in Relation to the Allocation of Water for Irrigation" between Meridian Energy Limited and the Mackenzie Irrigation Company Limited dated the 31 st of October 2006. <i>Clause 14.3</i>																								
<u>36</u>	WP05	<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>																								

		(b) Avoid leakage from pipes and structures; and (c) Avoid the use of water onto non-productive land such as impermeable surfaces and river or stream riparian strips.
47	WP06	(a) 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. (b) 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.
Mitigation		
58	WP07	<i>Name of waterbody:</i> Grays River <i>Map reference:</i> NZMS 260 I38:038-601 <i>Minimum flow:</i> 1.5 cubic metres per second <i>Flow graph:</i> See Report 2A <u>PROVIDED THAT whenever the flow in the Grays River at map reference NZMS 260 I38:038-601 falls below 2 cubic metre per second, the Canterbury Regional Council, in consultation with a Water Users Committee representing, but not limited to, surface water and hydraulically connected groundwater users, who are subject to the above minimum flow, has determined upon a water sharing regime which limits the total daily abstraction from the resource then the taking of water in accordance with that determination shall be deemed to be in compliance with condition [XXX] of this consent.</u>
Measuring & Metering		
9		The consent holder shall, six months prior to this consent being exercised, provide to the Canterbury Regional Council a certificate from the Consent Holder's solicitor certifying that the memorandum of encumbrance provided for in Condition (5) is registered on the computer registers for the land shown on Plan A, and any other evidence of registration as the Canterbury Regional Council may require (if any). <i>Clause 14.3</i>
610	ME02	<u>The consent holder shall, before the first exercise of this consent:</u> <u>a.</u> <u>(i) install a water meter(s) that has an international accreditation or an equivalent New Zealand calibration endorsement suitable for use with an electronic recording device, from which the rate and the volume of water taken can be determined to within an accuracy of plus or minus five percent at a location(s) that will ensure the total take of water from galleries I38/0057 and I38/0058 is measured; and</u> <u>(ii) install a tamper-proof electronic recording device such as a data logger that shall record (or log) the flow totals every 15 minutes and have the capacity to hold at least one season's (as specified in condition (3)) data of water taken as specified in clause (b) (i) , or which is telemetered, as specified in clause (b)(ii). <i>Clause 15.3(b)</i></u> <u>b. The water meter and recording device(s) shall be set to wrap the data from the measuring device(s) such that the oldest data will be automatically overwritten by the newest data (i.e. cyclic recording); and shall:</u> <u>(i) store the entire season's data in each 12 month period from 1 July to 30 June in the following year, which shall be downloaded and stored in a commonly used format and provided to the Canterbury Regional Council upon request in a form and to a standard specified in writing by the Canterbury Regional Council; or</u> <u>(ii) be connected to a telemetry system which collects and stores all of the data continuously with an independent network provider who will make that data available in a commonly used format at all times to the Canterbury Regional Council and the consent holder. No data in the recording device(s) shall be deliberately changed or deleted.</u> <u>c. The measuring device shall be installed at a site likely to retain a stable rating (i.e. a man-made channel, concrete, steel or fibreglass pipe). Installation shall be in accordance with ISO 1100/1-1981 or equivalent and</u>

		<u>be undertaken by a suitably qualified person.</u>
<u>117</u>	ME03	<u>The water meter and recording device(s) shall be accessible to the Canterbury Regional Council at all times for inspection and/or data retrieval. Clause 15.3(b)</u>
<u>128</u>	ME04	<u>The water meter and recording device(s) shall be installed and maintained throughout the duration of the consent in accordance with the manufacturer's instructions. Clause 15.3(b)</u>
<u>913</u>	ME05	<u>All practicable measures shall be taken to ensure that the water meter and recording device(s) are at all times fully functional and have an accuracy standard of $\pm 5\%$. Clause 15.3(b)</u>
<u>1014</u>	ME06	<u>The consent holder shall, within one month of any water meter and recording device(s) being installed, or within one month of any water meter and/or recording device(s) being replaced, and at five-yearly intervals thereafter, and at any time when requested by the Canterbury Regional Council, provide a certificate to the Canterbury Regional Council (Attention: RMA Compliance and Enforcement Manager) signed by a suitably qualified person certifying, and demonstrating by means of a clear diagram, that:</u> <u>a. the water meter and recording device(s) has been installed in accordance with the manufacturers specifications; and</u> <u>b. data from the recording device can be readily accessed and/or retrieved in accordance with conditions (11), and (12).</u> <i>Waterway: Grays River</i>
<u>1115</u>	WP08	<u>The Canterbury Regional Council (Attention: RMA Compliance and Enforcement Manager) shall be informed immediately on first exercise of this consent by the consent holder.</u> <i>Waterway: Grays River</i> <i>Map reference: NZMS 260 138:038-604</i> To be used with ME03-05
Farm Environment Management Plan		
Administrative Conditions		
<u>1612</u>	AD01	<u>The Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, shall be informed immediately on first exercise of this consent by the consent holder</u>
<u>1713</u>	AD02	<i>Number of working days: 5</i> <i>Month 1: March</i> <i>Month 2: July</i> <i>Waterbody: Grays River and tributaries</i> <i>Cross reference to Condition: 5</i>
<u>1814</u>	AD04	Lapse date

APPENDIX E – DRAFT FARM ENVIRONMENTAL MANAGEMENT PLANS

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APPENDIX F: DEROGATION APPROVAL



11 September 2009

Gillian Ensor
Environment Canterbury
PO Box 345
Christchurch

Dear Gillian

Application by Grays Hill Station Limited

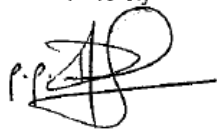
- 1 We write to you to outline the basis of Meridian Energy Limited (*Meridian*) providing its derogation approval of the application numbered CRC042661 by Grays Hill Station Limited. We refer to the letter to ECan from Chapman Tripp dated the 26th of June 2008 setting out Meridian's position on derogation approvals generally.
- 2 Meridian has read and considered the application CRC042661 by Grays Hill Station Limited and provides derogation approval on the following basis:
 - 2.1 Grays Hill Station Ltd shall only be entitled to take and use water from galleries I38/0057 and I38/0058 (between map reference NZMS 260 I38:050-617 and I38:081-642) at a maximum rate of 100 litres per second for the spray irrigation of 190 hectares identified in the application;
 - 2.2 The maximum daily volume shall not exceed 8,640 cubic metres per day and the maximum annual volume shall not exceed 1,140,000 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;
 - 2.3 the annual volume provided for in Clause 2.2 shall be time trached in accordance with the following table:

Table A – Maximum Rates & Volumes for CRC042661

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	100 l/s	8,640 m ³ /day	1,140,000 m ³ /annum
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1 September 2013 to 30 April 2014 and every year thereafter	100 l/s	8,640 m ³ /day	1,140,000 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 Grays Hill 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