

**Before the Commissioners appointed by Canterbury
Regional Council**

IN THE MATTER OF The Resource Management Act
1991

AND

IN THE MATTER OF Application CRC083609 by
Glentanner Station Limited for a
Water Permit to take & use
surface water.

Section 42A Officer's Report of Maria Bartlett

Date of Hearing: 21 September 2009

1. Pukaki Irrigation Company Limited proposes to install infrastructure for a new irrigation scheme, to be utilised by three properties to the south of Lake Pukaki, including Glentanner Station Limited. See Attachment One for a diagram showing the relationship of applications in process for the Pukaki Irrigation Scheme.
2. This report should be read in conjunction with the report prepared for surface water take application CRC062867, and associated discharge application CRC062869, which provide for irrigation of the same land area from an alternative intake location, both lodged by Glentanner Station Limited.
3. Reports for applications CRC082300, as well as CRC062866, CRC062870, CRC062871, CRC062872, lodged by Pukaki Irrigation Company Limited (PIC) for construction of irrigation scheme infrastructure are relevant to this report, as the applicant will rely on PIC infrastructure.
4. This report should also be read together with the introductory s42A report which gives an overview of all applications presented at this hearing (Report 1), the planning and technical reports on hydrology and minimum flows (Report 2A and 2B), the planning report outlining annual allocations (Report 3) and the reports on cumulative landscape and water quality effects in the catchment (Reports 4 and 5).

INTRODUCTION

5. Glentanner Station Limited (the applicant) has applied for a resource consent to:
 - (a) Take and use water from the Tekapo Stilling Basin, at map reference NZMS 260 H38:8842-7328 at a maximum rate of 116 litres per second and a volume not exceeding 1,200,000 cubic metres between per year, for spray irrigation of up to 200 hectares of crops and pasture and for stockwater use at Catherine Fields, State Highway 8, Lake Pukaki;

See Attachment Two for a map of the location of take and irrigation area, a map showing features within and adjacent to the property, and draft pivot plan.

6. The applicant engaged Ms Haidee McCabe of Irrigation Resource Solutions to prepare the application and assessment of environmental effects.
7. A duration to 30 April 2025 is sought.
8. This is an application for a new activity.
9. A site visit was carried out on 4 February 2009, by Maria Bartlett and Gillian Ensor of Canterbury Regional Council, with Ross Ivey of Glentanner Station. See Attachment Three for photos taken on the site visit.

Background

10. CRC082311 was lodged on 25 March 2008 and considered to be notifiable from 7 May 2008. The application specifies a location of take consistent with Pukaki Irrigation Company Limited land use application CRC082300, which proposes a pipeline route from the Tekapo Stilling Basin (Option 3) to the irrigation command area, crossing four ephemeral streams.
11. An earlier application, CRC071362, was lodged on 7 November 2006, proposing to irrigate the same land area, specifying locations of take consistent with Pukaki Irrigation Company Limited land use application CRC062866, which proposes to construct two possible intake sites for a new irrigation supply scheme, one in Pukaki Canal (Option 1) and one in Lake Pukaki (Option 2). In addition, the applicant has land use application CRC092721 in process to install and maintain an independent intake structure in Lake Pukaki, at the same location as the proposed Pukaki Irrigation Company Limited location to take from Lake Pukaki, also covered by water permit application CRC071362.
12. All four possible intakes are proposed as options for Glentanner Station Limited. I understand that the applicant intends to choose the most viable option, at which point one of the water permits, if granted, will no longer be required. In this respect, the outcome of the Pukaki Irrigation Company Limited land use applications will contribute to the decision regarding which water permit, CRC083609 or CRC071362, is implemented.
13. On 14 May 2009 the applicant confirmed that the intake location from Tekapo Stilling Basin would not be from the notified location of between NZMS 260 H38:8220-7260 and H38:8845-7324, but from NZMS 260: H38:8842-7328, approximately 50 metres north of the upper extent of the notified range, as a result of concerns expressed by Meridian Energy Limited. This change to the intake location was not considered cause for further notification of the application, as there is a reduction in effects on Meridian Energy Limited, and there are no parties adversely affected by the change who had not already submitted on the application.
14. On 9 June 2009 the applicant advised that stockwater no longer formed part of the application, as reasonable use requirements would be taken in accordance with Section 14(3)(b) of the RMA.
15. The applicant will choose the most viable option, either the Pukaki Irrigation Scheme infrastructure, or independent infrastructure, and proposes a non-concurrent use condition to be applied, in the event that both water permits are granted, to allow for the final chosen intake location to be used. Separate reports have been prepared for CRC071362 and CRC092721 (see Report 15b and Report 15c).

Notification

16. Details of the notification and wording are contained in Appendix 4 of the introductory s42a report (Report 1). This application was publicly notified on 18 October 2008.

Submissions

17. In the 2008 public notification, 10 submissions in total were made on this application. Of these:
- (a) 4 were in support;
 - (b) 6 in opposition; and
 - (c) 0 neither supported nor opposed the application.
18. A summary of submissions received on this application is contained in Table 1 below.

Submitter	Issues	Support/Neutral/Oppose	To be heard
Mr A J Gloag (Buscot Station)	Sustains the natural resource by preventing soil degradation and assisting against rabbit infestation	Support	No
Mr W G Murray (Glenmore Station)	Irrigation in the Mackenzie vital to sustainable land management	Support	No
Ruataniwha Farm Ltd	Make the farm more viable, provide hay and silage to help fatten stock	Support	No
Meridian Energy Limited	Need to comply with MIC tranching arrangements; need to consider water quality effects, both cumulative and individual; need to quantify stockwater component; MEL controlled low flows not accommodated; need to consider effects on MEL infrastructure; need water metering; contrary to Part II of the RMA	Oppose	Yes
Mr D W Thomas (Killermont Station)	Support new irrigation, agricultural growth and sustainability	Support	Yes
Land Information New Zealand	Insufficient information to assess impact on Crown Land/Pastoral Leases, easements may be required	Oppose	No
Department of Conservation (Twizel Area Office)	Contrary to Part II of the RMA; deficient effects assessment; water quality effects on ecosystems, including cumulative, not considered; preservation of natural character, protection of indigenous species not considered; not clear that fish screen will meet NIWA guidelines; Freshwater Fisheries Regulations may apply; need to consider Canterbury Conservation Management Strategy	Oppose	Yes
Royal Forest & Bird Protection Society Inc (South Canterbury Branch)	Concerned with land use intensification affecting landscape, water quality effects and impacts on native species, as well a potential increase in Canada geese population	Oppose	Yes
Fish & Game New Zealand (Central South Island)	Concerned with efficiency, water metering, water quality effects, fish screening, duration,	Oppose	Yes

Region)	land use intensification and amenity values.		
Canterbury Aoraki Conservation Board	Concerned with effects on wetlands through nutrient leaching and run-off; request a condition requiring funding of research into water quality effects	Oppose	

Table 1: Summary of submissions on application CRC083609

DESCRIPTION OF THE PROPOSED ACTIVITY

19. The applicant proposes the following:

- a) To take water from the Tekapo Stilling Basin at map reference NZMS 260 H38:8842-7328, at a maximum rate not exceeding 116 litres per second and a volume not exceeding 1,200,000 cubic metres per year;
- b) To comply with the minimum lake level for Lake Tekapo, as specified in Rule 3, Table 4 of the WCWARP;
- c) To use water for spray irrigation of up to 200 hectares of crops and pasture for grazing at Catherine Fields, State Highway 8, Lake Pukaki, using centre pivot irrigators primarily, with some further irrigation on the peripheral areas using K-line or hard hose;
- d) To use an annual volume of water for irrigation of 600mm per hectare, approximately 120 days irrigation, from October to April inclusive;
- e) To undertake soil moisture monitoring to effectively manage irrigation;
- f) To apply no more than half the average water holding capacity of the soil per return period of irrigation;
- g) To increase stocking rates to between 3 and 15 stock units per hectare;
- h) To install a suitable water metering device;
- i) To install a suitable fish screening device, determined after consultation with Fish and Game New Zealand, installed at the joint intake location in the Tekapo Stilling Basin, shared with Simons Pass Station Limited, Simons Hill Station Limited and Classic Properties Limited;
- j) To include a buffer zone outside the irrigation area of between 30 and 50 metres from the bed of an ephemeral water course;
- k) To institute a farm management plan and additional measures to mitigate against effects of irrigation on surface water and groundwater, as identified by the Mackenzie Water Research Limited study;
- l) To abide by standard conditions assigned by Mackenzie Irrigation Company Limited;
- m) To accept a non-concurrent use condition in the event that CRC083609 and CRC071362 are both granted.

LEGAL AND PLANNING MATTERS

Consent Requirements

20. The consent requirements under the Resource Management Act (RMA), Transitional Regional Plan, Proposed Natural Resources Regional Plan (PNRRP) and Waitaki Catchment Water Allocation Regional Plan (WCWARP) for water permit applications are outlined in the introductory s42A report (Report 1). A summary of the requirements for these applications are provided below:

WCWARP

- (a) Rule 3, clause (1) – The applicant proposes to adopt the minimum lake level for Lake Tekapo of 704.1 metres above mean sea level in the period October to March, and 701.8 metres above mean sea level in April (Table 4, row (ii)).
 - (b) Rule 6 – The proposed annual volume of 1,200,000 cubic metres is within the annual allocation limit of 275 million cubic metres for agricultural activities upstream of Waitaki Dam (applicable to abstraction from canals leading from the glacial lakes as per footnote 23, pg 52 of the WCWARP).
 - (c) Rule 17 – Classifying rule, complies with Rule 2 and Rule 6.
21. In summary, the proposed water permit is a **discretionary** activity and requires consent under S14 of the RMA.

Additional Requirements

22. The applicant is likely to require an archaeological authority from the Historic Places Trust before installation of irrigation infrastructure, where that infrastructure will disturb existing archaeological sites.

Priority

23. In terms of instantaneous allocation under Rule 3, a detailed list of all applicants who fall within Table 4, Row (ii) can be found in Report 2A. There are existing consent holders taking water from Lake Tekapo-Pukaki Canal for irrigation, and other applications seeking to take water from the canal, but Rule 3 does not contain a limit affecting priority for activities that must comply with the minimum lake level for Lake Tekapo. I note also that Meridian Energy Limited control flows in the canal and the cumulative rate of abstraction from the canal.
24. For Rule 6, all applications upstream of Waitaki Dam are within the allocation limit for agricultural and horticultural activities, so priority is not a concern with regards to the abstraction from Tekapo Stilling Basin (see Report 3 for annual allocation tables).

Derogation Approval

25. At the time of writing this report, Meridian Energy Limited has not provided approval for Glentanner Station Limited to derogate from its consents.

CONSULTATION

26. The applicant proposed to undertake consultation with Meridian Energy Limited, Fish and Game New Zealand, Department of Conservation (Twizel), Te Runanga o Arowhenua and Te Runanga o Waihao.

DESCRIPTION OF THE AFFECTED ENVIRONMENT

27. A description of the values of the Mackenzie Basin in general are provided in the introductory s42A report (Report 1).

28. *Tekapo Canal and Stilling Basin*

a) The applicant states:

- i. The Tekapo Canal and Tekapo Stilling Basin are man-made structures operated by Meridian Energy Limited and, as such, have limited environmental values.
- ii. The Tekapo Canal is approximately 26.5 kilometres long, with an average depth of 5.3 metres, a typical peak flow of 110 cumecs and a maximum flow of 130 cumecs.
- iii. The Tekapo Stilling Basin is situated prior to the Tekapo B power station, which discharges into Lake Pukaki and produces a nominal annual generation of 800 GWh.
- iv. State Highway 8 runs alongside the canal and Stilling Basin, and tourists can view the Stilling Basin from a side road off the State Highway.
- v. Salmonids inhabit the canal, including salmon, rainbow and brown trout, and recreational anglers make use of the canals and Stilling Basin.
- vi. Mount Cook Salmon Farm is situated in the canal several kilometres upstream of the proposed abstraction site.

b) I note that:

- i. Levels of Lake Tekapo are controlled by Meridian Energy Limited for the purposes of hydroelectricity generation, and lake levels are publicised on the Meridian Energy website at the following address, www.meridianenergy.co.nz/AboutUs/LakeLevels
- ii. Consented users of the Tekapo-Pukaki Canal, taking water for irrigation, are Mr & Mrs Andrew & Karen Simpson of Balmoral Station (CRC951545.1), The Wolds Station Limited (CRC952547 & CRC952550) and Irishman Creek Station Limited (CRC991667).
- iii. Didymo has been detected in the Tekapo-Pukaki Canal.

29. *Property Location – Catherine Fields*

a) The applicant states:

- i. Catherine Fields, the site of proposed irrigation, is located on terraces adjacent to the true left bank of the Pukaki River, approximately 600 metres from the south shore of Lake Pukaki and approximately 12 kilometres southwest from the Tekapo Stilling Basin intake location.

- ii. The property consists of approximately 435 hectares of gently rolling pasture, not currently irrigated, stocked with merino sheep and used for growing seasonal feed crops.
- iii. The western boundary of the property is land administered by Meridian Energy Limited adjacent to the Pukaki River, the northern boundary is DOC land, and Simons Pass Station flanks the eastern and southern boundaries.
- iv. The property is separate from Glentanner Station itself, which is located at the head of Lake Pukaki on the opposite shore. Catherine Fields passed to Glentanner Station as compensation, due to the station retiring high country land for the purposes of soil conservation.
- v. Stockwater is currently supplied by Meridian Energy Limited through a pipeline from Lake Pukaki to a reservoir at the head of the property, which is an arrangement stemming from the rising of Lake Pukaki and reduction of flow in the Pukaki River. The existing supply may not be sufficient to cover an increase in stocking rates on the property.

30. *Climate*

a) The applicant states:

- i. Estimated rainfall is 600mm annually, based on rainfall isohyets and records at Twizel (approximately 8.5 kilometres southwest of Catherine Fields).
- ii. Potential evapotranspiration (PET) is estimated to be 5mm per day over the December/January period, based on Tara Hills data (at Omarama, approximately 36 kilometres southwest)
- iii. The applicant also references trials undertaken at Glenbrook, Twizel, the results of which indicated a peak PET as high as 8mm per day.
- iv. The frequency of dry years currently results in crop failure every second year, (as identified by Ross Ivey on the site visit).

b) I note that:

- i. Effective seasonal rainfall is estimated to be 220mm in the Canterbury Regional Council GIS system.

31. *Soils and Vegetation*

a) The applicant states:

- i. Soils on the property are Tekapo well-drained shallow to deep sandy loams (greater than 50mm thickness) and Maryburn excessively drained shallow sandy loams (less than 4mm thickness), with lighter Mackenzie soils in areas not planned to be irrigated (Soils of the Upper Waitaki Basin, 1992).
- ii. The average PAW of soils are less than 75mm across the property.
- iii. Discussion with Ross Ivey, director of Glentanner Station, during a site visit on 4 February 2009, outlined that vegetation on the property had been primarily

hieracium a decade ago, but investment in fertilisation over the intervening period has improved groundcover.

- iv. Rye corn, oats and cocksfoot are grown on the property.
 - b) I note that:
 - i. Canterbury Regional Council land resources scientist Jeromy Cuff identifies dominant soils on the property to be Tekapo-Maryburn soils, and estimates PAW values of these soils to range between 30mm and 130mm. He specifies an average PAW value of 85mm, based on the work of Trevor Webb (see Attachment Four).
 - ii. Riley Consultants¹ describe the predominant soil on the property as Mt John Till, based on test pit excavations, having the following attributes: non-stratified till, sandy, fine to coarse gravel with minor cobbles, some boulders and traces of silt and clay; yellowish to light brown; dense to very dense; generally dry; well-graded; cobbles and boulders comprise angular to sub-angular, moderately weathered greywacke.

32. *Landscape and amenity*

- a) The applicant states that:
 - i. The proposed irrigation area is not visible from State Highway 8 due to a rise at the head of the property.
 - ii. The rolling hills between the State Highway and Catherine Fields are part of an area of terminal moraine, within which is a geopreservation area, administered by DOC, with a public access track to moraine landforms, including pillow lava.
 - iii. Glacial boulders are evident within this area of Catherine Fields, and the applicant noted on the site visit that boulders had been removed from the property in the past to allow cultivation, which had been provided to Meridian Energy Limited for use as rip rap material (seen on the shores of Lake Pukaki in the proximity of the Lake Pukaki spillway).
 - iv. Parts of the property may be visible within a 100 metre reach of the Pukaki River Road.
 - v. An historic rabbit fence, built in 1888 between Lake Pukaki and the Hakataramea Valley, starts on the property, travelling in a southeasterly direction (See Attachment Four of Report 34a for Simons Pass Station).
- b) I note that:
 - i. Areas of Catherine Fields are visible from DOC administered land, at elevated points, and from a public access track, which follows the eastern bank of an ephemeral watercourse on Catherine Fields south to the Tekapo River.

33. *Surface water*

¹ Further information provided with Pukaki Irrigation Company Limited application CRC062866 (15 December 2006, Appendix B).

- a) The applicant states:
 - i. At its closest point, the proposed irrigation area is approximately 130 metres from the true left margin of the Pukaki River bed, on a terrace approximately 60 metres above the riverbed.
 - ii. The Pukaki River is usually dry, with flow releases controlled by Meridian Energy Limited.
 - iii. An ancient glacial era watercourse runs through the centre of the property, with a bed estimated by the applicant to be between 20 and 200 metres wide.
 - iv. Primarily dry, this watercourse does flow during a flood event, and is estimated by Ross Ivey, in discussion, to have a flow width of approximately 2 metres in flood.

b) I note that:

There may be ephemeral tarns (kettleholes) within the rolling moraine areas in the north of the property, consistent with areas within the DOC conservation area to the north, and Simons Pass Station to the east².

34. *Groundwater*

- a) The applicant has not identified depth to groundwater on the property.
- b) I note that:
 - i. Test pit excavations, up to 5 metres deep, undertaken by Riley Consultants indicate the predominant Mt John Till soils to be generally dry (see paragraph 25).
 - ii. These excavations, up to 5m deep, also indicated that the Mackenzie type soils, not proposed to be irrigated and generally located within the bed and fan of the ancient watercourse, are described as moist or occasionally saturated.

35. *Ecology*

- a) The applicant has not identified ecological values for the property.
- b) I note that:
 - i. Joy Comrie of Department of Conservation advised that there were unlikely to be species present on the property that would require consideration or protection given the existing level of cultivation.

ASSESSMENT OF PROPOSED ACTIVITY

- 36. The proposed water permit is a discretionary activity and must be considered in the context of s104 of the RMA.
- 37. Section 104(1) outlines matters that the consent authority must have regard to when considering an application for a resource consent, including any actual and potential

² *Conservation Resources Report – Simons Pass Station*, prepared by DOC for LINZ, May 2008

effects on the environment, any relevant statutory provisions, and any other matter the consent authority considers relevant.

Assessment of actual and potential effects (s104(1)(a))

38. The effects that have been considered for this type of activity (to take and use water) are presented in the introductory s42A report. That report includes the presentation of the relevant planning provisions which direct us to consider these effects. A summary table regarding the assessment of individual effects for this application is provided below and a detailed discussion of those outstanding matters or areas of concern is provided in the following sections.

Adverse Effects	Applicant's assessment	IO assessment	Conclusion
Ecosystems	Minimum lake level & fish screen proposed; improved groundcover will prevent soil loss; access for hunters to control Canada geese population	Details of fish screen required, to meet NIWA guidelines; limited ecological values within irrigation area; didymo threat to intake	Effects minor, provided fish screen meets NIWA guidelines.
Other water users	MIC shares held; little impact on flow in canal	Combined intake with Simons Pass, Simons Hill and Classic Properties is 0.3% of flow in canal; MIC shares held by all parties; metering of abstraction is proposed at the intake, and boundary to Glentanner Station; assessment on other irrigation abstractors not provided, but Meridian control abstractions from canal and flow rates	Effects minor
People, communities & amenity values	No impact on tourists or recreational users of the Stilling Basin due to modified environment and low abstraction rate; positive impact on community from increased production; property viable	Agree that users of the Stilling Basin are unlikely to be adversely affected; minimum lake level retains values; and there will be benefits locally as a result of irrigation, as well as viability improved; archaeological assessment required for 1888 Rabbit Fence	Effects may be more than minor on archaeological site
Landscape	Irrigation development not visible from state highway; no cumulative effects assessment; removal of glacial boulders already occurred in majority of proposed irrigation area; 130m buffer to Pukaki River	Development visible from parts of DOC track, and by air; pivot infrastructure and increased greening (although green crops already present); irrigation to be compatible with landform patterns; maintain natural character of river margin; moraine hillocks should be left as tussock grassland	Cumulative effects may be more than minor

Inefficient use	MIC share annual volume of 1,200,000m ³ close to Policy 16(c)(ii) assessment, based on average soils PAW <75mm; light Mackenzie soils will not be irrigated; fully piped gravity fed scheme, with centre pivots and other forms of irrigation	Annual volume of 1,060,000m ³ considered efficient, based on reasonable use assessment and average soils PAW 85mm; 530mm requirement, rather than 600mm per hectare	Effects may be more than minor
Water quality	Soil water holding capacity not exceeded; centre pivot use; soil moisture monitoring; buffer zones to waterbodies; 25mm soils not irrigated; nutrient output managed; MWRL report re cumulative effects and mitigation	Ensure light soils not irrigated; mitigation proposed is appropriate; no irrigation of northern moraine areas	Effects may be more than minor, depending on results of MWRL report and additional mitigation proposed.
Tangata Whenua values	Not identified.	No submission made by any Runanga.	Effects uncertain

Table 2: Summary of Assessment of Effects

Effects on ecosystem values

39. The applicant has not provided details of fish screen design. Provided the applicant accepts a condition requiring installation of a fish screen that complies with guidelines in the NIWA *Fish Screening: good practice guidelines for Canterbury*, effects on ecosystems can be considered minor.
40. The Royal Forest & Bird Protection Society Inc (South Canterbury Branch) and Fish and Game New Zealand (Central South Island Region) raised concerns about effects of land use intensification on the population of Canada Geese. The applicant proposes to allow access to hunters for population control, as required.
41. The applicant proposes to comply with the minimum lake level for Lake Tekapo, so ecosystem values of the lake will be protected.
42. Didymo was detected in the Tekapo-Pukaki canal at the Mt Cook salmon farm on 24 June 2009, approximately 3 kilometres from the Tekapo Stilling Basin. The organism would challenge performance of the intake and fish screen if it does establish in the canal.

Effects on other water users

43. The applicant proposes to comply with standard conditions assigned by the Mackenzie Irrigation Company Limited, including ceasing abstraction during periods when maintenance of the canal and Stilling Basin is undertaken or flows in the canal are reduced, at request from Meridian Energy Limited. Effects on the operations of Meridian Energy Limited can therefore be considered to be minor.
44. The applicant proposes water metering in relation to the proposed abstraction. Metering at the PIC intake location will be for a combined rate of abstraction by Simons Pass Station Limited, Simons Hill Station Limited and Glentanner Station Limited. Accurate metering and monitoring of the entire combined abstraction from Tekapo Stilling Basin will be necessary to ensure that the combined rate authorised

by all consents does not exceed the rate Meridian Energy Limited have agreed to supply.

45. Regarding other users of the canal, further abstraction from the Tekapo-Pukaki Canal has the potential to reduce reliability of supply to existing abstractors. I note, however, that Meridian control the overall rate of abstraction from the canal and the rate of flow, such that reliability of supply is a matter between abstractors and Meridian Energy Limited.

Effects on natural character and landscape

46. The applicant has acknowledged that users of the DOC administered public access track are likely to be able to see irrigation infrastructure and green areas on Glentanner Station.
47. The area is already extensively cultivated, with green crops grown within the proposed irrigation area. However, the presence of centre pivot irrigators, as proposed, will introduce manmade structures to the landscape.
48. The Royal Forest & Bird Protection Society raised concerns about effects of land use intensification on landscape in its submission, including cumulative effects. While the proposal is limited in its effects to 200 hectares of Catherine Fields, likely to only be visible from a single public access track or by air, it is one of many proposals to irrigate areas not previously irrigated in the Mackenzie Basin, and it is therefore appropriate to consider the cumulative effects of irrigation on landscape in the region.
49. In relation to cumulative landscape effects, I note that this proposal is being advanced in conjunction with other proposals to utilise a shared intake to be built by the Pukaki Irrigation Company Limited. Neighbouring Simons Pass Station and Simons Hill Station Limited propose to irrigate a total of 4800 hectares, the majority of which has not been previously irrigated and is situated on the Pukaki outwash flats southeast of Glentanner Station, and Classic Properties Limited (Maryburn Station) propose a further 234 hectares, most of which has been previously irrigated to the east of the Mary Range.
50. A separate report has been prepared in relation to effects on landscape (refer to Report 5). Chris Glasson recommends a buffer to the Pukaki River, positioning of irrigation to be compatible with landforms, and no irrigation of moraine hillocks. At present the irrigation command area includes rolling moraine leading to existing cultivated areas to the mid-south of the property. A draft pivot plan for the property (see Attachment Two) indicates development is not planned to occur on the northern moraine areas of the property. Levelling of moraine areas to accommodate pivot structures would is not supported.
51. I am satisfied that localised adverse effects of the proposed activity can be considered minor, subject to conditions limiting the location of irrigation, as recommended in Report 5 and noted in paragraph 42. However, as this proposal is dependent on access to the Pukaki Irrigation Scheme proposal to supply water from Tekapo Stilling Basin to four properties, totalling 5,234 hectares, I am not satisfied that cumulative effects of the proposed activity on landscape can be considered to be minor.

Effects on people, communities and amenity values

52. Effects on amenity values will be primarily related to enjoyment of the landscape, which is discussed in the previous section.

53. I acknowledge that there may be positive effects on the local community, and regional and national economic benefits as a result of the proposed activity, due to increased production. In addition, climate change may impact on frequency of dry years in the future, affecting the viability of the property in the long term.
54. The proposed activity is likely to disturb the Rabbit Fence, built in 1888, that runs through the irrigation command area, which is classed as an archaeological site under the Historic Places Act. The applicant has not provided an archaeological assessment or considered effects of the proposed activity on the site. Without such an assessment, I cannot be certain that effects on people, communities and amenity values, related to the heritage preservation, will be minor.

Effects of inefficient take and use of water

55. Regarding delivery of water to Catherine Fields, I note that the proposed abstraction from Tekapo Stilling Basin will utilise gravity feed, which is a more efficient use of energy resources than the option to pump from Lake Pukaki. I also note that the proposal will involve an entirely piped scheme, in line with Policy 19 of the WCWARP, rather than the open race option that forms part of the Pukaki Irrigation Company Limited proposal to take from Lake Pukaki or Pukaki Canal.
56. Regarding management of the abstraction to ensure compliance with stated efficiencies, in addition to metering at the intake location in the stilling basin, metering of the use of water on Glentanner Station will be required to ensure that the consent holder does not exceed the maximum rate of take and use of water authorised by CRC083609. This should involve metering at a point in the supply pipeline that captures all water supplied to Glentanner Station from the stilling basin, and is likely to be located at the boundary of the property, given that the Pukaki Irrigation Company Limited applications propose only to supply water to the boundary of each property. Location will be dependant on negotiation between the applicant and Pukaki Irrigation Company Limited.
57. I note that irrigation may include K-Line and hard hose guns on parts of the property, which may not meet the stated efficiency of centre pivot irrigators. However, the applicant is proposing to make the best use of available technology to irrigate effectively and efficiently.
58. The applicant proposes to take water at a rate not exceeding 116 litres per second, and use up to 1,200,000 cubic metres of water per year for irrigation of 200 hectares. The irrigation volume has been based on share allocation issued by Mackenzie Irrigation Company to allow application of 600 millimetres per hectare per year.
59. The applicant has undertaken an assessment of seasonal irrigation demand using the Policy16(c)(ii). Assumptions about the proposed activity have been made as follows:
- land use = intensive pasture
 - average PAW of soils = 75mm
 - total seasonal demand = 815mm/ha/yr
 - effective rainfall (based on NRRP map) = 225mm/ha/yr
 - annual allocation required = 1,180,000m³ or 590mm per hectare

60. I have consulted the Regional Council GIS maps and identified effective rainfall as 220mm/ha/yr. I have also referenced maps provided by CRC soils scientist Jeromy Cuff, which consolidate the best available soils information for the Upper Waitaki catchment, and have identified the average PAW of soil on the property as 85mm. Annual allocation required, based on those revised inputs is 1,060,000m³, or approximately 530mm per hectare
61. The applicant has indicated that 530mm per hectare will be insufficient, and that the alternative, included in Policy 16(c) of the WCWARP, of basing annual volume on soil-moisture measurements, local rainfall and evapotranspiration modelling for the 1-in-5 year dry season should be the method used to establish an appropriate annual volume.
62. Details of soil-moisture measurements, local rainfall and evapotranspiration modelling necessary to determine an alternative annual volume have not been provided. Until such time as the information is made available to CRC, and the accuracy of data and modelling has been assessed by CRC, I cannot be satisfied that the proposed annual volume of 1,200,000 represents an efficient and effective use of water.

Effects of water use on water quality

63. There are a number of submissions which identify water quality as a result of land use intensification as a concern, including from Meridian Energy Limited, Department of Conservation, Royal Forest and Bird Protection Society, and Fish and Game New Zealand.
64. I note that there are no permanently flowing waterways on the property, although there is an ephemeral watercourse through the proposed irrigation area and may be ephemeral tarns (kettleholes) in the rolling moraine areas in the north of the property. The draft pivot plan provided by the applicant indicates that irrigation is not planned in the northern moraine areas. The applicant proposes a buffer distance from the ephemeral stream, which will assist to prevent run-off to the waterway or leaching to shallow groundwater in the area of the stream.
65. In addition, the Pukaki River only flows intermittently, depending on flow releases controlled by Meridian Energy Limited. The property is situated on a terrace 60 metres above the riverbed, and a setback distance of 130 metres from the proposed irrigation area is proposed.
66. The applicant is not proposing to irrigate light Mackenzie or Larbreck soils on the property, and intends to manage application rates, while monitoring soil moisture levels, minimising potential leaching and contamination of groundwater. The applicant has identified the location of soils appropriate for irrigation. Attachment Four shows blocks of medium soils in the areas chosen for centre pivot irrigation, as per the draft pivot plan in Attachment Two.
67. The applicant proposes to provide a farm management plan outlining all mitigation measures to be used on the property to limit localised and cumulative effects on water quality.
68. In relation to cumulative water quality effects, I note that this proposal is being advanced in conjunction with other proposals to utilise a shared intake to be built by the Pukaki Irrigation Company Limited, as outlined in paragraph 41. Consideration of the cumulative effect on water quality of all four properties sharing the PIC intake is appropriate, as this application will not be granted as a stand alone activity.

69. The report by MWRL has been audited and a separate s42a report prepared (see Report 4a).
70. Given that all mitigation proposed to address localised and cumulative water quality effects has not been identified, pending a farm management plan from the applicant, I cannot be certain that effects on water quality will be minor, at the time of writing this report.

Conclusion

71. With regard to s104(1)(a), the actual and potential effects of the proposed activity have been discussed above. For this application, I am not satisfied that under s104(1)(a), the actual and potential effects of the proposed activity in its current form will be minor. In particular, there remains uncertainty regarding effects on people and communities (with respect to heritage protection), cumulative effects on landscape and water quality, and effects of inefficient use of water.

Relevant Statutory Provisions (s104(1)(b))

Regional Policy Statement (RPS)

72. Under Section 104(1)(b)(iii) of the RMA, the consent authority shall have regard to any relevant regional policy statement. The Canterbury Regional Policy Statement has been operative since 26 June 1998.
73. Of significance to this application is Chapter 9, which relates to the management of the Region's water resources. The WCWARP and PNRRP take into account policies in the RPS and address the issues outlined in more detail. Any assessment of effects has been made using these documents and therefore I have had regard to the RPS throughout this assessment.

Waitaki Catchment Water Allocation Regional Plan (WCWARP)

74. The objectives and policies of the WCWARP that are relevant to each potential adverse effect have been identified in the introductory s42A report. A table of all those objectives and policies considered to be applicable to this application is appended in Attachment Three. A discussion of the objectives and policies which are particularly relevant to this application is provided in the following paragraphs.

Objectives

75. Objectives 1 and 2 are key objectives in relation to the proposed taking of water. I have considered whether Objective 1 can be met in terms of sustaining the quality of the river and surrounding environment. This is a finely balanced decision and that while the proposal may not entirely be consistent with Objective 1 and the associated policies (particularly policy 13 regarding water quality, and policies regarding the reasonable use of water), it is difficult to determine if the inconsistencies are significant enough to make the proposal contrary to Objective 1.
76. The proposed activity will impact on the matters outlined in Objective 1, particularly (b) and (c). There have been parties who have submitted against the proposed activity due to concerns about impacts on these values. I therefore cannot determine whether the proposed activity is contrary to these values at the time of preparing this report.

77. Objective 4 aims to achieve a high level of technical efficiency in the use of water. The applicant has proposed to use a combination of centre pivots and other spray irrigation methods, from a piped gravity fed scheme, using soil moisture probes, which is considered to be technically efficient.

Policies on water quality

78. Policy 13 deals with water quality issues resulting from land use intensification and enables the consent authority to have regard to the water quality objectives in the PNRRP. The WCWARP incorporates by reference Objectives WQL1, 2 and 3 of the PNRRP which contain particular outcomes to be achieved in the regions waterbodies. Report 4, by Dr Mike Freeman, addresses water quality matters in more detail, particularly on the cumulative scale. Until the applicant provides details of the farm management plan, and given the conclusions in Dr Freeman's report, I cannot be certain that the application is consistent with this policy at the time of writing this report.

Policies on efficient and effective use

79. Policies 15 – 20 deal with efficient and effective use and all are applicable to this application.
80. Policy 15 ensures that the rate of abstraction and the annual volume is reasonable for the intended use. As discussed in the assessment of effects section of this report, I am not satisfied that the annual volume is reasonable for the intended use.
81. Policy 16 provides guidance for determining reasonable and efficient use for agriculture activities. As discussed in the assessment of effects, I am not satisfied that the requested volume of water meets the reasonable use test in this policy.
82. Policy 19 encourages the piping or sealing of water distribution systems. The proposal is consistent with this policy.

Conclusion

83. With regard to s104(1)(b), the relevant provisions of the RPS and WCWARP have been considered above. I cannot be certain the application is consistent with Policy 13 due to cumulative effects on water quality, and the proposed activity is inconsistent with Policy 15 and Policy 16 due to the requested annual volume being higher than the Policy 16 reasonable use test indicates is required. In addition, I cannot make a conclusion about whether the application is consistent with Objective 1 of the WCWARP given the number of submissions to be heard.

Other Matters

84. With regard to s104(1)(c), the consent authority can consider any other matter relevant and reasonably necessary to determine the applications. I consider that the high court decision *Aoraki Water Trust and Others v Meridian Energy Limited*³ is relevant to this application (see discussion in Report 1).

³ [2004] NZMRA 251

Part II Purpose and Principles

Purpose of the RMA (s5)

85. Under Section 104, the consent authority must consider applications “subject to part II” of the RMA. The purpose of the RMA (Section 5(1)) is to:

“promote the sustainable management of natural and physical resources.”

86. The proposal will allow the development of land to occur, which may provide for the economic and social well-being of the community. The applicant has proposed measures to “avoid, remedy or mitigate” the potential impacts on ecosystems, water quality, amenity and landscape values as required in Section 5(2)(c), but there are localised and cumulative effects identified that require further mitigation.

Matters of National Importance (s6)

87. Sub-sections (a), (b), (e) and (f) of Section 6 of the RMA are particularly relevant to this application. The proposal will result in a change in natural character within an area of outstanding natural landscape. A buffer zone to Pukaki River and the ephemeral watercourse has been proposed to address effects on natural character of the river and stream margins. There remain outstanding concerns regarding cumulative effects of development within an area of outstanding natural landscape. The relationship of Maori to their ancestral lands and water is relevant, although Te Runanga o Ngai Tahu have not submitted on the application. The applicant has not proposed to protect historic heritage with the irrigation command area, or assessed effects on the archaeological site present.

Other Matters (Section 7)

88. In achieving the purpose of the RMA, the consent authority is directed to have particular regard to a number of matters as set out in (a) – (j) of Section 7.
89. Sub-sections (a), (b), (c), (d), (f), (g), (h) and (i) are relevant to this application. Kaitiakitanga, or good stewardship, is represented by irrigation outside of areas of light soils and outside of the northern moraine area, as well as proposed buffer zones to the river and stream, and use of soil moisture monitoring to manage irrigation.
90. Section (b) relates to the efficient use of water and, as discussed above, the requested annual volume may not represent an efficient use of water
91. Section (c) relates to maintenance or enhancement of amenity values. The applicant proposes to site the activity out of sight of the state highway, and away from river and stream margins.
92. Section (f) refers to maintenance and enhancement of the quality of the environment. There remain outstanding concerns regarding cumulative effects on water quality.
93. Section (g) relates to the finite characteristics of natural resources and is relevant to the taking and use of water. The requested volume of water does not recognise the finite nature of the resource in the Upper Waitaki Catchment, as it may be in excess of requirements.
94. Section (h) refers to protection of habitat of trout and salmon, which is adequately addressed by screening to exclude fish at the intake.

95. Section (i) refers to the effects of climate change. Abstraction from the hydroelectricity lakes and canals, while putting pressure on generation capacity, will reduce pressure on naturally flowing rivers and streams, which may experience lower flows due to increased frequency of dry years and reduced snowmelt.

Principles of the Treaty of Waitangi (s8)

100. Section 8 of the RMA requires the consent authority to take into account the principles of the Treaty of Waitangi. The site lies within the rohe of Arowhenua Runanga. Te Runanga o Ngai Tahu have not submitted on the application.

RECOMMENDATION

Grant or Refuse

96. Section 104B applies to any application which is a discretionary or non-complying activity and states that the consent authority may grant or refuse the application and may impose conditions under s108.
97. The application proposes to establish irrigation of 200 hectares of Catherine Fields, within an overall command area of approximately 407 hectares, none of which has been previously irrigated. The applicant intends to use infrastructure installed by the Pukaki Irrigation Company Limited, which has three options in process. This application seeks to make use of the option to run a buried pipeline from the Tekapo Stilling Basin entry canal to the proposed irrigation area (Option 3).
98. There are, however, a number of outstanding issues associated with this proposal as listed below:
- (a) *People, community and amenity values* - Adverse effects on an archaeological site within the proposed irrigation command area have not been addressed;
 - (b) *Natural character and landscape* – Cumulative effects on landscape have yet to addressed by the applicant;
 - (c) *Efficient and reasonable use* – The applicant proposes an annual volume greater than reasonable use estimates predict is required;
 - (d) *Water quality* – Cumulative effects on water quality have yet to addressed by the applicant.
99. Given uncertainty regarding cumulative effects on landscape and water quality, and given inconsistency with Policy 15 and Policy 16, regarding efficient use of water, I am unable to recommend that the application be granted.

RECOMMENDED CONDITIONS

100. If the Commissioners decide to grant this application, a list of conditions that are usually included in a water permit, and explanation for their inclusion, are provided in Appendix 6 of the introductory s42A report. A list of conditions for this application is included below. The italicised conditions are shorthand, with the full condition listed against the unique identifier in Appendix 6.
101. I am not satisfied that these conditions would adequately mitigate cumulative adverse effects of the proposed activity.

CRC083609 – To take and use surface water

1. *WP01*
Water shall only be taken from Tekapo Stilling Basin, at surface water abstraction point H38/0227, at or about map reference NZMS 260: H38:8842-7328, at a maximum rate of 116 litres per second, with an annual volume not exceeding 1,060,000 cubic metres between 1st July and the following 30th June.
2. *WP04*
Water shall be used only for spray irrigation of 200 hectares of crops and pasture for grazing sheep, beef cattle, deer or non-milking dairy cows, as described in the application, on the area of land shown in attached plan CRC083609, which forms part of this consent.
3. Irrigation shall not occur within the following areas:
 - i. on soils with an average water holding capacity of 25mm or less;
 - ii. within 130 metres of the bed of the Pukaki River;
 - iii. within 50 metres of the bed of any watercourse;
 - iv. within moraine areas containing ephemeral wetlands or tarns;
 - v. within any area unsuitable for use of centre pivot irrigators due to natural topography.
4. There shall be no leveling of glacial moraine landforms to enable use of centre pivot irrigation.
5. There shall be no disturbance of, or damage to, the historic Rabbit Fence constructed in 1888 resulting from the use of water for centre pivot irrigation.
6. This consent shall not be exercised concurrently with consent CRC071362.
7. *WP08 Fish Screen*
8. *WP05 Avoid wastage of water*
9. *WP06 Backflow prevention*
10. Whenever the level of Lake Tekapo is at or below 701.8 metres above mean sea level in the months April to September inclusive, and at or below 704.1 metres above mean sea level in the months October to March inclusive, abstraction shall cease.
11. *Metering condition – MIC Conditions 12-15 – from Tekapo Stilling Basin*
12. *ME04 Certification*
13. *ME05 Certification*
14. *Metering condition – MIC Conditions 12-15 – from the irrigation supply canal at the boundary of Simons Pass Station, such that all flow to Simons Pass Station passes the metering device*
15. *ME04 Certification*
16. *ME05 Certification*
17. *AD03 Review*
18. *AD04 Lapse*

Signed:



Maria Bartlett
Consents Investigating Officer

Date: 28 August 2009

REFERENCES

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Ministry for the Environment, 2006. Waitaki Catchment Water Allocation Regional Plan.

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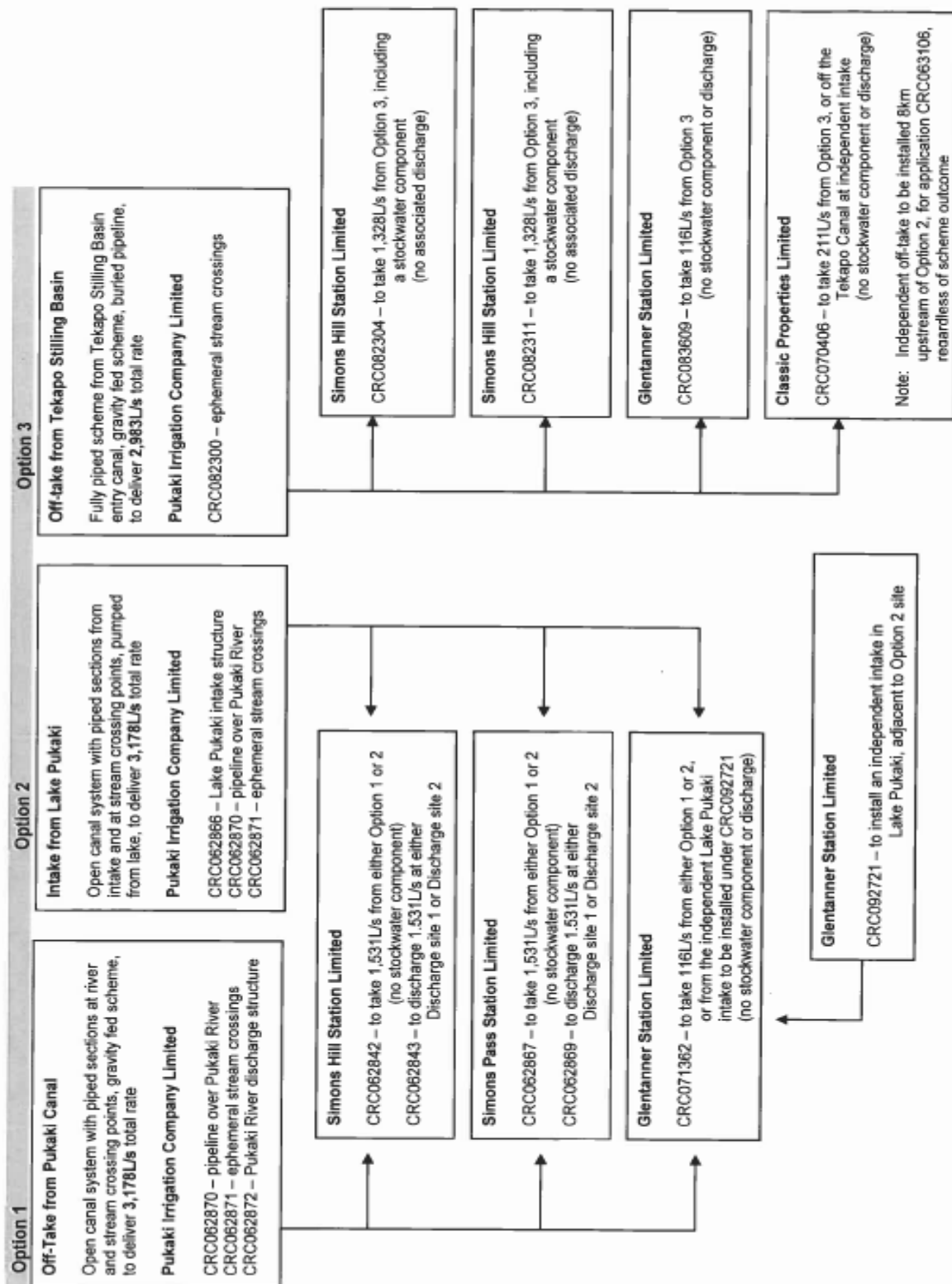
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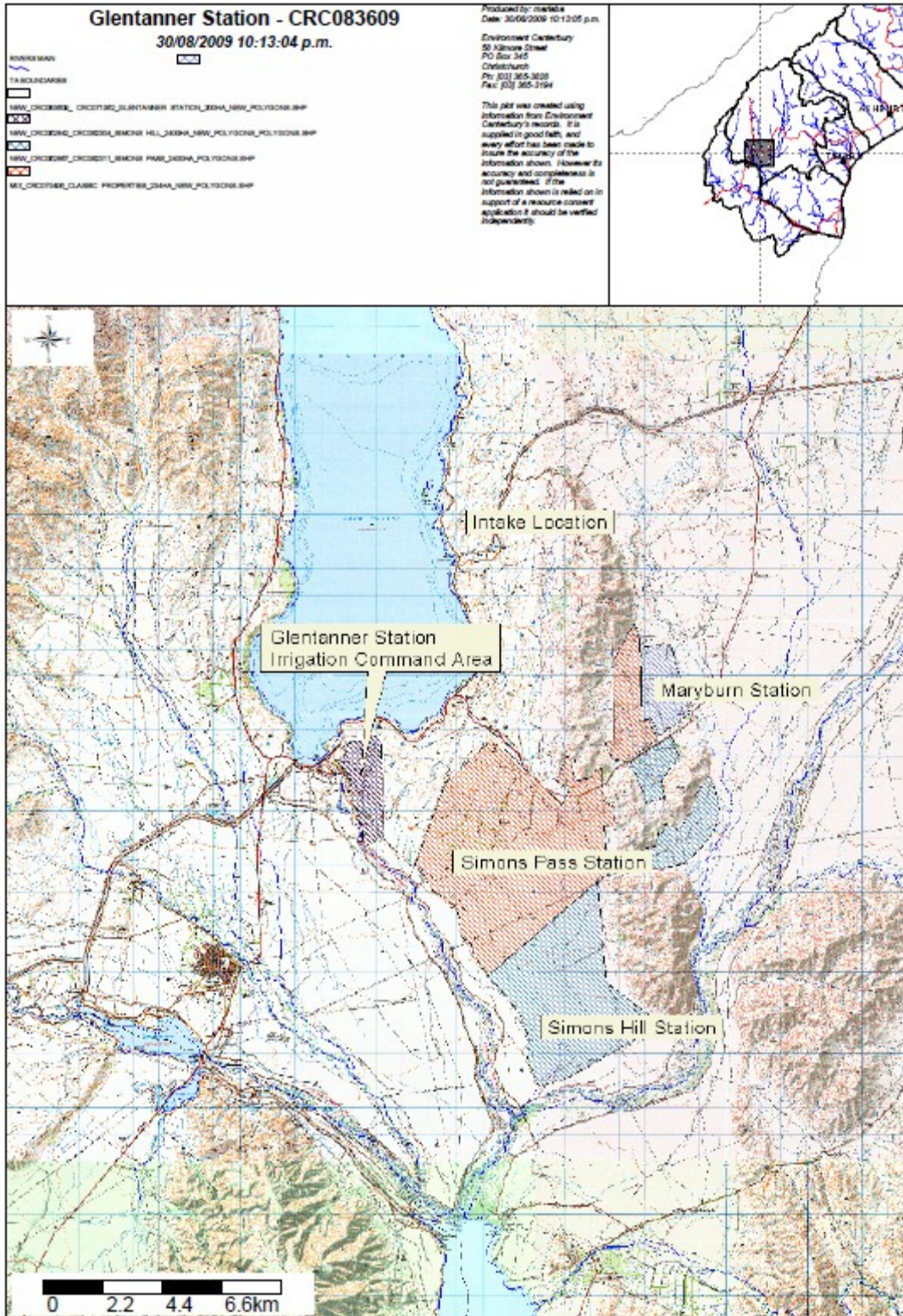
ATTACHMENT ONE: PUKAKI IRRIGATION SCHEME

This diagram shows the relationship of applications lodged by all applicants that are part of the scheme.

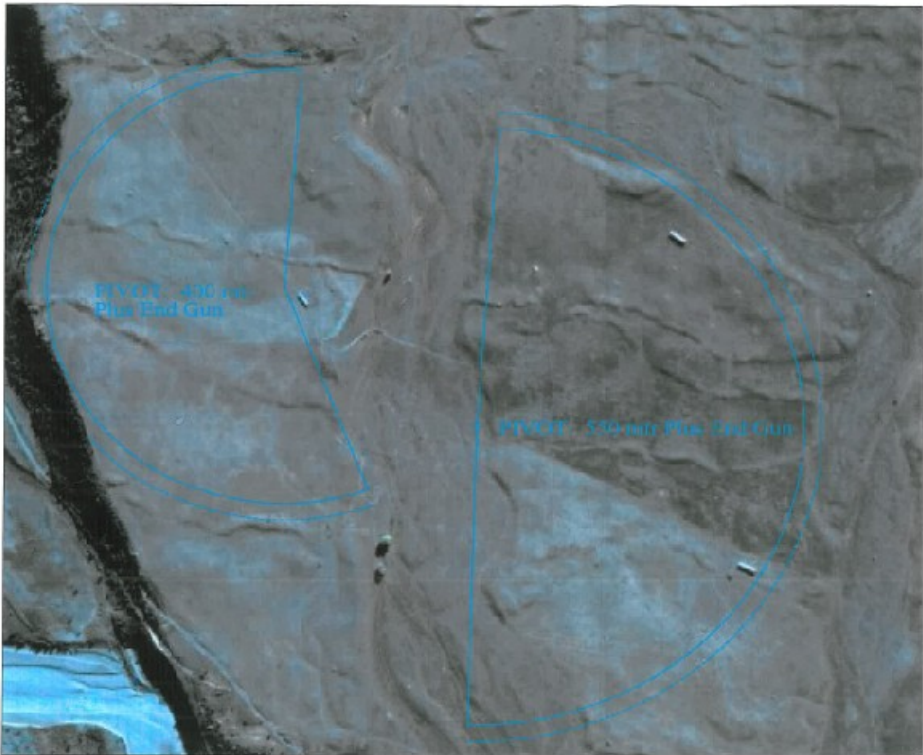
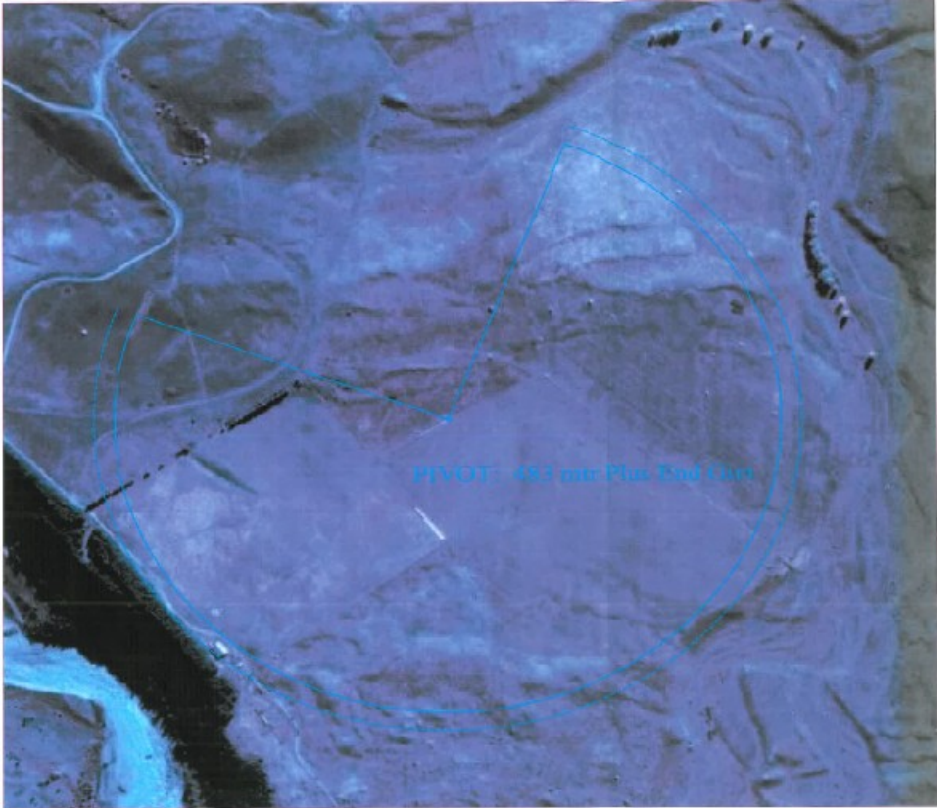


ATTACHMENT TWO – LOCATION MAPS

The following map shows the relationship of Glentanner Station to the intake location, and to other properties associated with the Pukaki Irrigation Scheme optino to take water from Tekapo Stilling Basin via a gravity fed buried pipeline (Option 3).



The following are draft pivot plans provided by the applicant showing proposed irrigation areas on Catherine Fields, with a single ¾ pivot west of the ephemeral stream, and two half pivots further south, one each side of the ephemeral stream.



ATTACHMENT THREE – PHOTOS OF IRRIGATION AREA

Photos taken by Maria Bartlett during site visit on 4 February 2009.



Photo 1 – Entry road to Catherine Fields, alongside the site of Pivot 1, rye corn has been drilled



Photos 2-5 – Pivot 1 irrigation site, with the rise to State Highway shown in Photo 2



Photos 6-9 – views of the Pivot 2 irrigation area, looking generally southeast from the access road
 Photos 10-12 - looking back westwards towards the access road across Pivot 2 area



Photos 13-16 – views from the head of the property looking over an arc roughly north to east, DOC Conservation area shown in the sequence



Photos 17-19 – views from the head of the property looking over an arc roughly east to south, towards the irrigation area

ATTACHMENT FIVE – OBJECTIVES & POLICIES

Objective / Policy	Description	Assessment
Objective 1	To sustain the qualities of the environment of the Waitaki River and associated beds, bars, margins, tributaries, islands, lakes, wetlands and aquifers.	Submissions concerned about values in Objective, cannot determine that application is consistent with these values.
Objective 2	Provide water for different activities.	Activity is within allocation limit for activities above Waitaki Dam
Objective 3	Recognise that there are beneficial and adverse effects on the environment at a national and local scale.	These factors have been considered in the assessment of effects.
Objective 4	Achieve a high level of technical efficiency in the use of water.	The applicant is proposing a technically efficient system.
Objective 5	Provide for practical and fair sharing of allocated water during times of low water availability.	Appropriate minimum lake level proposed
Policy 1	Recognising connectedness between all parts of the catchment	Matters related to cumulative allocation have been considered
Policy 3	Setting of environment flow and level regimes for all activities in Objective 2 and consistent with Objective 1.	The minimum lake level is set for Lake Tekapo and accepted by the applicant
Policy 4	Outlines a number of matters that must be considered when setting an environmental flow and level regime	The minimum lake level is set for Lake Tekapo and accepted by the applicant
Policy 11	Consider effects on Tangata Whenua values, local and national effects when allocating water to activities	Effects on Tangata Whenua have been considered, and national and local effects
Policy 12	Outlines matters that must be considered when establishing allocation limits.	The allocation limit is set for agricultural activities above the Waitaki Dam and the application is within this limit
Policy 13	Addresses water quality objectives in the NRRP	Water quality effects on rivers, lakes and groundwater are uncertain
Policy 15	Ensuring take and use of water is reasonable for its intended use	Applicant is requesting water above what may be reasonably required and has not provided information to support the additional amount requested
Policy 16	Requiring irrigation applications to meet the specified reasonable use test	As above – applicant has not provided information to support the additional amount requested
Policy 19	By encouraging the piping or otherwise sealing of water distribution systems	Water is proposed to be an entirely piped supply
Policy 21	By requiring the installation of water measuring and recording devices	The applicant proposes appropriate metering
Policy 23	Restricting water use in times of low water availability, except for reasonable domestic and stockwater needs	The minimum lake level is set for Lake Tekapo and accepted by the applicant
Policy 24	To take reasonable stockwater requirements in times of low water availability	The minimum lake level is set for Lake Tekapo and accepted by the applicant
Policy 35	Setting a minimum lake level for these lakes, to apply to agricultural activities	The minimum lake level is set for Lake Tekapo and accepted by the applicant