

BEFORE THE CANTERBURY REGIONAL COUNCIL

IN THE MATTER OF

The Resource Management Act 1991

AND

IN THE MATTER OF

an application by **Rosehip Orchards NZ Limited** filed under **CRC072118** for a water permit to take and use water from the Ohau C canal for the purpose of irrigating 610 hectares approximately 7 km south-east of State Highway 8 (SH8), Twizel.

**REPORT AND DECISION OF HEARING COMMISSIONERS PAUL ROGERS,
MICHAEL BOWDEN, DR JAMES COOKE AND EDWARD ELLISON**

PART B - SITE SPECIFIC DECISION

1 INTRODUCTION

- 1.1 This is a decision on an application by **Rosehip Orchards NZ Limited** (the applicant). It is one of many decisions we have made on 104 applications by various applicants for water permits and associated consents in the Upper Waitaki Catchment.
- 1.2 The decision should be read in combination with our Part A decision, which sets out our findings and approach to various catchment wide issues that are common to multiple applications. References to our Part A decision are made throughout this decision as appropriate.

2 THE PROPOSAL

- 2.1 The applicant's current proposal (as modified during the hearing) is to take and use water from the Ohau C canal between map references NZMS 260 H39: 842-492 and H39: 852-481, 7 km south-east of State Highway 8 (SH8), Twizel. The proposed maximum rates of take are as follows:
- (a) 422 litres per second (l/s)
 - (b) 255,226 cubic metres (m³) per week; and
 - (c) 3,660,000 m³ of water per year.
- 2.2 The take of water will be metered and a fish screen will be installed on the intake.
- 2.3 Water will be used for spray irrigation of up to 610 hectares (ha) of rosehips and crops, such as lucerne, and pasture grazed by non-dairy stock, such as cattle and sheep. Stock will not be allowed to access the Twizel River in the area of the proposed irrigation development. Figure 1 shows the location of the take and the proposed irrigation area.
- 2.4 Water will be conveyed to the irrigation area via a closed pipeline and irrigated onto land via centre pivot. An application rate of 6 mm/day is proposed, however as the application rate for centre pivot irrigators is between 15 – 20 mm/day, a return period of 3-7 days is also proposed. The irrigation season will be between September and April, inclusive.

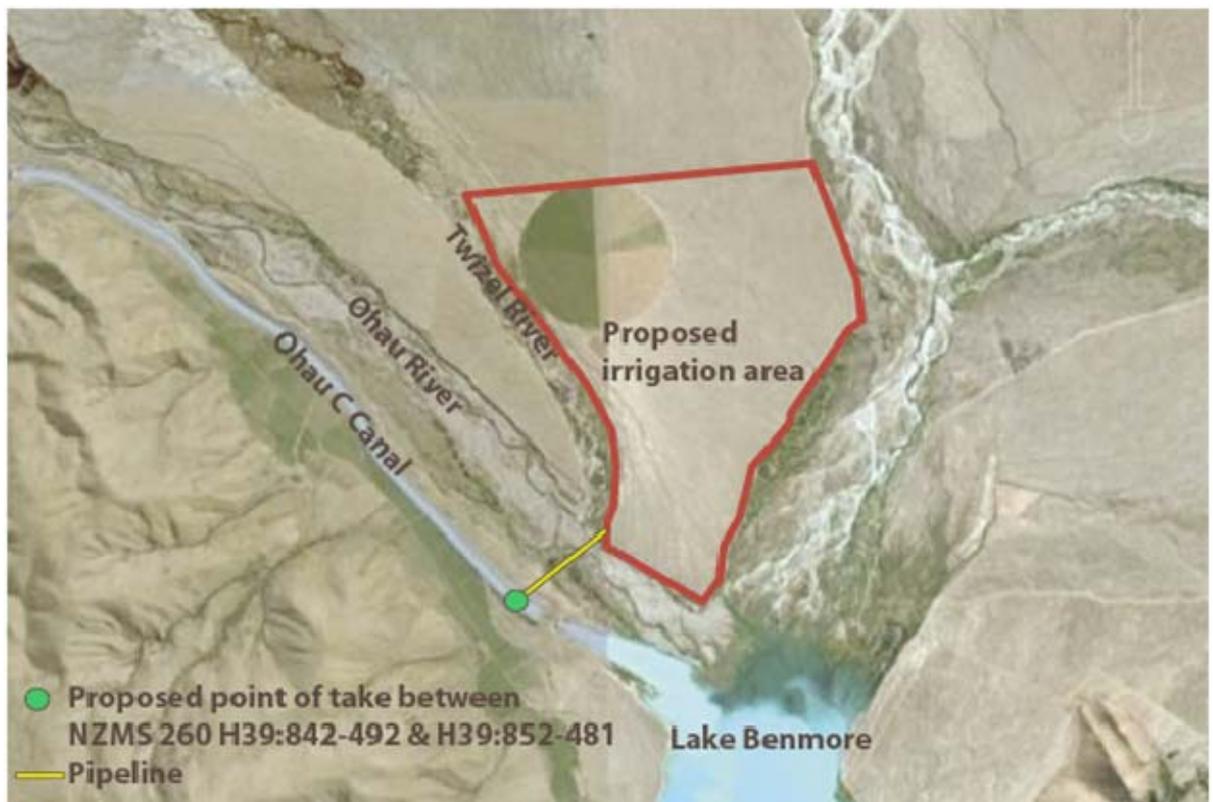


Figure 1: Location Map. Note that this figure is for illustrative purposes only and the application and applicant's evidence has been used to determine exact locations.

The application

- 2.5 The application is a water permit to take and use surface water pursuant to section 14 of the RMA. Consent is required under the Waitaki Catchment Water Allocation Regional Plan (WCWARP), as discussed below.
- 2.6 The application (CRC072118) was lodged with the Canterbury Regional Council (the Council) on 19 January 2007. The application was publicly notified and there were a number of submissions that are referred to later in this decision. The application is for a new activity and requested a consent duration to 2025.

Modifications since notification

- 2.7 Originally the applicant applied to irrigate up to 810 ha of land at an annual volume of 4,860,000m³. Following notification, the applicant reduced this to the current proposal of 610 ha at an annual volume of 3,660,000m³. The rates of take per second and per week were also reduced to the current rates described above.
- 2.8 The applicant was also initially proposing that a minimum lake level for Lake Ohau and Pukaki was not being proposed. The applicant suggested that the consent should be subject to the minimum lake level of Lake Ruataniwha. However, in evidence presented at the hearing, and the right of reply, the applicant confirmed that it would accept the minimum lake level of Lakes Pukaki and Ohau, as set out in Table 4 of the WCWARP.
- 2.9 The general principle for modifications after notification is that amendments are allowed provided they do not increase the scale or intensity of the activity or significantly alter the character or effects of the proposal. The key consideration is prejudice to other parties by allowing the change. In this case, we are satisfied that the changes do not significantly alter the intensity or effects of the proposal and that no party would be adversely affected by allowing the changes.

Related consents and applications

- 2.10 In addition to this application, the applicant has also applied for a land-use consent to disturb the bed and banks of the Ohau River for the installation of a pipeline, from an intake structure installed in the wall of the Ohau C canal, to the proposed irrigation area (CRC072117). This application is discussed in a separate decision. It should be noted that consent is not required for the installation or maintenance of the intake structure as this occurs within an artificial waterway.
- 2.11 The applicant currently holds an existing consent to take and use groundwater at a rate of 92 l/s from bore H23/0035 (CRC030175), which was granted in 2002.
- 2.12 In addition, the applicant also applied for water (CRC021749) and land-use (CRC021750) permits associated with a new surface water take from the Twizel River to irrigate the remaining land not irrigated under the existing consent. These applications have since been withdrawn.
- 2.13 The proposed annual volume does not include any provision for stock water for the property. The applicant states that stockwater is obtained under the rights prescribed in the RMA in s14(3), as acknowledged on page 14 of the Waitaki Allocation Board (WAB) decision (Annex 1, 2005). The applicant has not stated that the requested annual volume sought includes allowances for stock water, therefore, it is assumed that the annual volume requested is solely for "irrigation purposes" and is additional to the volumes permitted by s14(3) of the RMA.

3 DESCRIPTION OF THE ENVIRONMENT

Applicant's Property

- 3.1 The applicant's property consists of a 930 ha block of gently sloping flat land located between the Twizel and Tekapo Rivers. Some of this land is currently irrigated and used to grow rosehips, with the remainder being undeveloped barren grassland that is lightly grazed (i.e. less than 0.5 stocking units per hectare (SU/ha)).
- 3.2 The irrigation area is not within a Statutory Acknowledgement Area or a Silent File Area. Lake Benmore, located adjacent to the irrigation area is a Statutory Acknowledgement Area.

Transpower's "BEN-ISL-A" power line and supporting structures run through the middle of the proposed irrigation area in a general north to south direction.

Ohau Canal

- 3.3 The abstraction location from the canal is located approximately 1.8 km upstream of the Ohau C Power Station. It is also adjacent to DoC 'river recovery ponds' and downstream of the black stilt conservation ponds in the Ohau River. The Lake Ohau C canal, administered by Meridian Energy Limited (MEL), is an artificial channel, which was commissioned in 1984/85 and links Lake Ruataniwha to Lake Benmore. A labyrinth weir (zig zag) is located downstream of Ohau B power station and MEL occasionally releases water into the Ohau River via this weir.
- 3.4 The applicant stated that instream values in the canal are low, however salmon are present in the canal and a salmon farm is also located within it.

Rivers

- 3.5 The Lower Ohau River is located downstream of Lake Ruataniwha dam. The flow in this part of the river is largely controlled by MEL. Splash flows are released monthly and occasionally water from the Ohau C canal is allowed to spill into the river via the labyrinth weir (upstream of the proposed intake).
- 3.6 The Twizel River flows into the Lower Ohau River approximately 1.5 km upstream of the Lake Benmore. The applicant states that from general observations, the Lower Ohau River bed is generally dry with some ponded areas between Ruataniwha Dam and the confluence with the Twizel River.
- 3.7 These ponded areas however, are part of a recognised conservation area, used by DoC as a captive breeding centre for black stilt. This area also provides habitat and breeding areas for other birds, such as the banded dotterel, black fronted terns and wrybills.
- 3.8 Fish species such as brown and rainbow trout, common bully, upland bully, Chinook salmon, sockeye salmon and long finned eels have been recorded in ponds upstream of Lake Benmore.
- 3.9 Other users that may be affected by the proposal include MEL and DoC. In addition, the canal is used for fishing and the lower reach of the Ohau River (extending 2 km upstream of the Benmore Dam) provides opportunities for fishing and other recreational pursuits (such as jet boating, swimming, etc).

Site Visit

- 3.10 We detailed our site visits in Part A and we do not repeat this information here. We did visit the site on the ground to ensure we were familiar with the environment within which the proposed activity would take place.

5 PLANNING INSTRUMENTS

- 5.1 As discussed in our Part A decision, there is a wide range of planning instruments that are relevant under the RMA. This includes national and regional policy documents, along with regional and district plans. The key planning instruments relevant to this application are as follows:
- (a) Waitaki Catchment Water Allocation Plan (WCWARP);
 - (b) Natural Resources Regional Plan (NRRP);
 - (c) Proposed and Operative Canterbury Regional Policy Statement (CRPS); and
 - (d) Mackenzie District Plan (MDP)
- 5.2 The provisions of these planning instruments critically inform our overall assessment of the application under s104(1)(b) of the RMA, as discussed in Section 14 of this decision. In addition, the rules within the relevant planning instruments determine the status of the activity, as set out below.

Status of the activity

- 5.3 In our Part A decision we provide a detailed discussion of our approach to determining the status of activities. We now apply that approach to the current application.
- 5.4 This application was lodged after the WCWARP was made operative. The following rules from the WCWARP are applicable to this application:
- (a) Rule 3 – The applicant proposes to adopt minimum lake level of Lakes Pukaki and Ohau as set out in Table 4.
 - (b) Rule 6 – The activity is within the allocation limit of 275 million cubic metres for agricultural activities upstream of the Waitaki Dam.
 - (c) Rule 17 – Classifying rule – The proposal is classified as a discretionary activity as it complies with Rules 3 and 6.
- 5.5 Overall, the proposal is a **discretionary activity** under the WCWARP and resource consent is required in accordance with section 14 of the RMA.

6 NOTIFICATION AND SUBMISSIONS

- 6.1 This application was notified on 4 August 2007 with a large number of other applications for similar activities in the Waitaki catchment. Twenty submissions in total were received, including:
- (a) 2 in support;
 - (b) 16 in opposition; and
 - (c) 2 neither in support nor opposition.
- 6.2 Table 2 is based on the relevant s42A reports and summarises those submissions that directly referenced the application. In addition to those listed, there were other submitters that presented evidence at the hearing that was relevant to this application. The relevant evidence from submitters is discussed in more detail later in this decision. Please note that all submissions hold equal importance, even if not specifically listed below.

Table 1. Submissions made on the application

Submitter	Position	Reasons / Issues
Fish and Game New Zealand	Oppose	In addition to other abstractions, the allocation limits may be exceeded.
Meridian Energy Ltd	Oppose	Water quality and metering. Effects on MEL infrastructure. Reliability of supply during low flow conditions.
S Mahon & A Erickson	Oppose	Effects on natural character of the Mackenzie Basin and surface water quality.

- 6.3 Overall, the key effects of concern relating to applications within the Waitaki catchment including this application include those on ecosystems, water quality, existing and other allocations, minimum flows and natural character.

7 THE SECTION 42A REPORTS

- 7.1 A report on the application and submissions was prepared by the Regional Council's Investigating Officer Ms Yvette Rodrigo. The report was supported by specialist reports prepared by:
- (a) Mr David Stewart – Hydrology
 - (b) Mr Chris Glasson – Landscape
 - (c) Mr Tom Heller – Cumulative Water Quality Effects

- 7.2 In her report Ms Rodrigo identified the following matters as outstanding and requiring further explanation by the applicant at the hearing:
- (a) Minimum lake levels - No minimum lake level has been proposed by the applicant and this issue needs to be resolved to determine the status of the application and to determine the impacts on hydro-electric generation and MEL, resulting from the take and use of water from the canal.
 - (b) Surface water quality - The applicant has not confirmed whether measures proposed when the application was lodged with ECan are adequate to mitigate impacts on water quality, and consistent with the findings of the MWRL study. The impacts on water quality may therefore not be acceptable;
 - (c) Landscape and amenity - The irrigation area is close to sensitive amenity areas and will be visible to the public using the State Highway.
 - (d) Transpower infrastructure – The applicant has not assessed the impacts of irrigation on Transpower’s assets that are located within the proposed irrigation area.
 - (d) Cultural Values - The applicant has not assessed the impacts of the proposal on cultural values.
- 7.2 Mr Glasson placed this application within his Landscape Unit 3 – Pukaki. He told us that this is a vast area of glacial outwash plains, bordered by Lake Pukaki, Simons Pass, the Grampians, and the Ohau River. In the northern part of this area, near to Lake Pukaki, the rocky and undulating moraine hills are a significant feature giving topographical relief to an otherwise flat basin landscape of river terraces and flats.
- 7.3 Mr Glasson told us that panoramic views form part of the travel experience through this Unit, with a focus not only on the expansive landscape but also on Mount Cook/Aoraki and the Southern Alps. Two scenic viewing areas (SVAs) are described in the Mackenzie District Plan as being close to the southern end of Lake Pukaki along State Highway 8. He told us lake protection areas (LPAs) exist around Lake Pukaki and the eastern side of Lake Benmore, while relevant sites of natural significance (SNS) include the Tekapo and Pukaki Rivers and parts of the Ohau River, Lake Pukaki, and the flats between Lake Pukaki and the settlement of Twizel within the Waitaki District, which borders outstanding landscape areas (OLAs), include the west side of Lake Benmore.
- 7.4 He told us that this Unit’s landscape is most frequently appreciated from State Highway 8 and the canal roads as they weave their way across this flat to gently undulating landscape. He told us views can also be gained from the power stations of Ohau B and C; while an elevated observation point exists at the southern end of Lake Pukaki.
- 7.5 Mr Glasson expressed the opinion that it is a Unit that is sensitive to change because of the visibility of its vastness and open landscape, and the consistency of land cover and colour; albeit he said there is an ever increasing presence of wilding pines in the landscape unit. Modifications include, he said, irrigated areas of pastoral grassland, elements of the Upper Waitaki hydro scheme, shelter belts and woodlots, wilding pines, farm dwellings, pylons, and the settlement of Twizel.
- 7.6 He told us the Pukaki, Twizel and Ohau Rivers and Lake Pukaki contribute significantly to recreational pursuits and the inherent scenic and amenity values of this Unit. As well, he told us, camping facilities are found in several locations, most notably at Twizel and Lake Benmore.
- 7.7 He advised us the recreational value for Twizel River is high for sight-seeing, trout angling, and four-wheel driving. Mr Glasson’s comments in terms of recreational values are well supported by Mr Rob Greenaway, an expert in recreational issues for Meridian.
- 7.8 He informed us that several large irrigation sites are proposed within this landscape unit at Simons Pass and adjacent to Twizel, being Rose Hips Orchards New Zealand Limited and this application. Simons Pass/Simons Hill encompasses a landscape type of outwash plains and river terraces.
- 7.9 Mr Glasson also told us in his original report that given amendments made to the application to include an irrigation design that integrates with the landscape with irrigation occurring only on the river terrace surface and keeping suitable buffer distances from rivers and irrigating in a continuous manner he was satisfied there would be landscape effects, which he characterised as moderate to minor.

8 THE APPLICANT'S CASE

- 8.1 Legal counsel for the applicant, Mr Kelvin Reid, presented opening submissions and called eight witnesses as follows:
- (a) Mr John Lyons - Director, Rosehip NZ Limited
 - (b) Mr Peter Glasson - Project Manager
 - (c) Mr Ian McIndoe - Groundwater Consultant
 - (d) Dr Gregory Ryder - Water quality and aquatic ecology
 - (e) Mr Graeme Ogle - Farm Management Consultant
 - (f) Dr Melissa Robson - Environmental Scientist
 - (g) Dr Valerie Snow - Farm Systems Modelling
 - (h) Dr Michael Steven - Landscape Architect

Mr Reid – Legal Counsel

- 8.2 Mr Reid introduced the proposals for Rosehip Orchard New Zealand Limited and High Country Rosehip Orchards Limited. He noted that both sites are located across the dry Pukaki River from the Pukaki Flats. They are separate proposals to irrigate areas of land between the Pukaki and Ohau Rivers. Two separate takes are proposed from the Ohau Canal. Water is conveyed by a pipeline under the Ohau River to irrigate areas of barren land on both properties via pivot irrigators.
- 8.3 Mr Reid then covered background matters such as the farming systems undertaken High Country Rosehip Orchard Limited and their history. He provided us information in relation to the applicant's position in relation to MWRL's Water Quality Study (the WQS). In this regard, Mr Reid's basic submission was that for Rosehip Orchards NZ Ltd, the Pukaki groundwater resource was the principal receiving environment and on the very conservative basis adopted to assess effects in relation to nitrogen discharge, there were in his view significant surpluses of assimilative capacity for the proposed farming systems.
- 8.4 He addressed us on the statutory framework and traversed evidence to do with effects and pointed out key findings within that evidence.
- 8.5 He confirmed for us the applicant's adoption of a threshold outlined in the WQS with internal adjustments pursuant to the partial sub-catchment agreement for the Pukaki groundwater zone. He told us that FEMPs for each property had been developed by Dr Robson and those FEMPs seek to address the issues of water quality and cumulative effects of nutrient losses. He told us that the farm management, monitoring and mitigation recommendations of Dr Robson are all being adopted by this applicant.
- 8.6 Mr Reid pointed out positive effects such as economic gains and also positive effects to do with land management. He noted that the biological systems relevant to this application are in decline. There is significant soil loss and farm production is diminishing over time.
- 8.7 He then addressed us on plan provisions, referring us in detail to Mr Kyle's materials.
- 8.8 Focusing on water quality issues, he submitted that having regard to the explanation of the relevant policies, the policies are not directed to protection of groundwater itself but rather ensuring that land use intensification does not give rise to adverse effects in biological systems such as streams or lakes where groundwater may ultimately end up.
- 8.9 He also submitted that it was clear from the explanation that the proposed NRRP thresholds were set without the benefit of the detailed enquiry that we were undertaking on the basis of the detailed scientific evidence that was to be presented to us. He submitted the WQS represents a region-wide study of a scale and significance that was simply not available at the time the proposed NRRP was notified.

- 8.10 He also submitted that the groundwater threshold is not set at a level above which adverse effects on biological systems will occur; it is set at a level that is highly precautionary and potentially to an extreme degree. He contended that a proper effects based assessment of potential adverse effects on relevant biological systems ought to be preferred to the standard if such an assessment is available. He then went on to say, having said that, this applicant has chosen to adopt farm management practices that ensure that it will comply with this very precautionary threshold.
- 8.11 Mr Reid then proceeded to address us on Part 2 RMA matters. In conclusion, he told us for this applicant the applications made represent the only remaining option in their attempt to return their property to productive potential. He was of the view that the application represents the essence of sustainable management and should be granted on the conditions as sought.
- 8.12 As part of his submissions he provided us a table summarising the s42A officer's report and providing a response to each issue raised in that report.

Mr Lyons - Applicant

- 8.13 Mr John Charles Lyons is a Director of the applicant company and High Country Rosehip Orchards Ltd .
- 8.14 Mr Lyons said that the applicant has a long-standing interest in part of the property through an agreement to purchase the land east of the Twizel River comprising a total land area of 973.5 ha.
- 8.15 Mr Lyons' interest in growing rosehips was stimulated after understanding the significance of the contents of the rosehip berry obtained from the Sweet Briar plant. The Sweet Briar plant (*Rosa rubiginosa*) grows wild in the Mackenzie Basin and is generally considered by farmers as a weed.
- 8.16 Mr Lyons explained that the rosehip berry is made up of three basic elements, the outer flesh, hairs and seeds. The flesh (rosehip shells) contains the highest concentrations of Vitamin C of any fruit. It currently is used mainly in the production of rosehip tea (Herbal Tea). The seeds contain valuable oil used in the cosmetic industry (rosehip oil). In short the rosehip berry was considered excellent for a new growth industry.
- 8.17 He then told us that the original orchard concept involved various methods of establishing sizeable orchards on broad acre dry land areas in the Mackenzie Basin. As there were no large concentrations of Sweet Briar plants on land for grading into crude orchard rows, as had occurred elsewhere in the basin, it was decided to establish the first orchard on the western block by transplanting of rooted plants from previously graded land in the Omarama area. A total of 115,000 plants were pulled from the ground by a team of workers from the Twizel area, transported to RONZ, planted using a locally designed automated planting machine and finally established into orchard rows 3 m apart.
- 8.18 Mr Lyons then described the significant issues around plant growth limitation the venture encountered which led to Crop & Food Research Ltd (CFR) being engaged to assist in the process of establishment.
- 8.19 It became clear that for a Rosehip Project to have any chance of success, irrigation was going to be a fundamental requirement. The costs required to seek water rights and establish a full scale operation utilizing irrigation, processing and marketing, required a major rethink of the potential project.
- 8.20 Mr Lyons said that a new business plan was developed to maximize the potential ingredients of the rosehip berry after various lines of research was carried out under contract by CFR. In particular, research was undertaken to identify the potential of the antioxidant activity of the berry.
- 8.21 Mr Lyons said that the applicant company was established as a result of the CFR work together with certain other information obtained offshore. Over the following two years while resource consent was being sought for irrigation water from a well drilled on the land, the company commissioned various research under contract with CFR.
- 8.22 Mr Lyons said that formal establishment of the first rosehip orchard commenced on site under the newly established 200 ha centre pivot irrigation operation in 2002.
- 8.23 Within the first two years after planting the orchard, a series of issues saw the company having to replant the orchard with further rosehip seed. Unfortunately these issues continued to effect

the establishment of the orchard over the following three years and in turn threatened to compromise the viability and future of the project. The Directors of the company eventually had to concede that the establishment of the orchard had not been successful at this time.

- 8.24 Mr Lyons said that it was now recognized by the Directors of both companies that an entirely new concept for the establishment of the rosehip orchards would be required together with a significant new budget to take the project forward. The future of the project is now effectively in limbo.
- 8.25 Mr Lyons informed us that lucerne production has continued with very good results and favourable comments from the market place regarding the superior quality of the product for animal feed. The soils within the irrigated area are improving year by year, with the consistency of plant growth visibly improving significantly.
- 8.26 Finally Mr Lyons said that the applicant is now seeking resource consent to irrigate for a more traditional range of uses. Rosehip production remains an option for the future.

Mr Glasson – Project Manager

- 8.27 Mr Peter Glasson, Director at SolutioNZ RM Limited, is the project manager for the applicant. Mr Glasson is also project manager for four other applicants subject to this consent process including the neighbouring High Country Rosehip, Simons Pass and Simons Hill Stations.
- 8.28 Mr Glasson provided an overview of the applicant's property and the proposed irrigation scheme. Mr Glasson explained that the applicant has one operating centre pivot on their property, irrigating 200 ha, with the water being sourced from groundwater. Mr Glasson confirmed that the applicant intends to retain this permit 'following the supply of water from the Ohau Canal'.
- 8.29 Mr Glasson had several meetings with Meridian Energy Limited and considerable correspondence with Meridian Energy representatives relating to overall Basin wide project issues such as derogation approval, and WQS investigations. He also met with Meridian specifically in relation to Rosehip Orchards, to ascertain Meridian's concerns specific to the applicant's own properties.
- 8.30 Mr Glasson also met with Meridian's groundwater consultant (Mr Peter Callander), Meridian representatives, and his client's groundwater consultant (Mr Ian McIndoe) in a formal "caucusing" meeting to discuss groundwater issues. Although no agreement was reached on issues, concerns expressed by Meridian at the meeting resulted in the commissioning of additional field work on the Tekapo and Lower Tekapo River.
- 8.31 Mr Glasson indicated that considerable consultation had occurred with representatives of Te Runanga o Ngai Tahu (TRONT) and the three local runanga (Te Runanga o Arowhenua, Te Runanga o Waihao and Te Runanga o Moeraki). The consultation effort was concentrated across the four properties he acts for.
- 8.32 Mr Glasson stated that one of the main issues identified was the present scarcity of mahinga kai (food gathering sites and resources) areas within the Basin, This concern was linked to the potential effect of any degradation on water quality resulting from the proposed activity on the Pukaki Flats causing further deterioration and possible loss of mahinga kai areas in the Lower Tekapo and Haldon Arm.

Mr McIndoe – Groundwater Consultant

- 8.33 Mr McIndoe Groundwater Consultant, Aqualinc Research Ltd said that the application site was located south of the Twizel Township. The Twizel and Ohau Rivers border the property to the west, the Pukaki and Tekapo Rivers are to the east, and Lake Benmore is to the south.
- 8.34 Mr McIndoe explained that the applicant was proposing to take water at a maximum rate of 422 ℓ/s , 255,226 $m^3/7$ days and up to 3,660,000 m^3/y annually from the Ohau C canal, for irrigation of up to 610 ha of land between the Pukaki and Twizel Rivers (Twizel flats). The irrigation of the 610 ha was in addition to the existing 200 ha of centre-pivot irrigation that currently occurs under resource consent CRC030175. Water will be piped under gravity from the Ohau C Canal to the property.

Irrigation Infrastructure

- 8.35 Describing the infrastructure Mr McIndoe said that the applicant proposed to use centre-pivot irrigation systems, primarily to grow pasture and forage crops for stock grazing.
- 8.36 He said that on-farm pipelines would be PVC pipe or similar, buried with minimum 400 mm cover. Power lines would be installed to supply electricity to pumps and irrigators and other infrastructure on the property.
- 8.37 The applicant proposed to use two full circle centre pivots and three part circle pivots. Mr McIndoe's preliminary irrigation design indicated that the pivots would most likely range in radius from 500 m to 870 m. The pivots would not cross over any waterways.

Efficient Use

- 8.38 The annual volume of 3,660,000 m³/y was based on Mackenzie Irrigation Company share allocations of 6,000 m³/ha/year over the irrigation areas (i.e. 6,000 m³/ha x 610 ha [or 500 ha] = 3,660,000 m³/y [or 3,000,000 m³/y]).
- 8.39 The analysis indicates that the applicants may have insufficient water to fully meet demand more frequently than 20 % of the time. They will therefore have to manage the proposed irrigation system to achieve application efficiency greater than 80 % to ensure significant yield losses do not occur in drought years.
- 8.40 Soil moisture monitoring is proposed to be carried out to ensure over-watering does not occur and maximum possible water use efficiency is achieved.
- 8.41 Mr McIndoe said that the application efficiency for the Mackenzie and Larbreck soils would be at least 78 to 86%. He was confident that irrigation on this property can achieve 80% application efficiency overall.

Irrigation Runoff

- 8.42 Mr McIndoe then discussed the likelihood of ponding and irrigation redistribution on the Mackenzie and Larbreck soils which he concluded was minimal. As Rosehip Orchards consists only of Mackenzie and Larbreck soils, ponding and redistribution is not expected to be an issue.
- 8.43 He pointed out that Mackenzie and Larbreck soils occur adjacent to the Ohau River and the Ruataniwha Wetlands, but given irrigation runoff is very unlikely, irrigation in this area would not have any adverse effects on the river or wetlands in his view.

Stockwater

- 8.44 Mr McIndoe said that stockwater would be sourced from the Ohau C and Ohau B Canals together with the water required for irrigation. The stockwater would be reticulated around the farms using polyethylene pipelines and no discharge from the stock water distribution system would occur.
- 8.45 The applicant will provide on-farm storage of water as a backup to cover for periods when the irrigation take is on restrictions.
- 8.46 Mr McIndoe said that stockwater has not been included in consent CRC072118. A separate application would be lodged by the applicant for the take and use of water for stock and domestic supply, if the applications for irrigation water were granted and progressed by the applicant. However, until the stockwater consent was granted, the applicants would rely on Section 14(3)(b) of the RMA.

Effect of Abstraction on the Ohau B and C Canals

- 8.47 Mr McIndoe believed that the main effect of abstraction of water from either of the canals was the impact on Meridian Energy in the form of loss in power generation. The fishery within the canal could also be affected. Hutton Salmon Ltd is located approximately 3.6 km and Cairn Station approximately 0.8 km upstream of the proposed intake for Rosehip Orchards.

- 8.48 However Meridian Energy has provided derogation approval for the abstraction and fish screens would be installed on the intake in accordance with an agreed approach with Fish & Game. This would deal with that issue.

Effect of Proposed Takes on Other Users Supply Reliability

- 8.49 Mr McIndoe said that there are no abstractions of water from the Ohau B or C canals for town, domestic, or stockwater supply. On that basis, there will not be any adverse effects on surrounding community, domestic and stock water supplies.

Twizel River and DOC Conservation Areas

- 8.50 Mr McIndoe said that the Twizel River and associated DoC conservation area borders Rosehip Orchards on the lower western area of the property. The Twizel River flows year round.
- 8.51 The proposed irrigation areas are located at the top of terraces, elevated above the river and DoC reserve area. A fence has been constructed approximately 20 m from the edge of the Twizel River on the applicant's property.
- 8.52 Irrigation would only occur on top of the terraces. There would be a large buffer distance between the irrigated areas and the river, within which irrigation will not occur.
- 8.53 Mr McIndoe's analysis of irrigation efficiency and the potential for surface runoff showed that the runoff was extremely unlikely on Rosehip Orchards because irrigation would be on Mackenzie and Larbreck soils where ponding is unlikely. Regular inspections would be made for ponding and potential runoff and if it becomes an issue, mitigation, probably through fitting a variable depth irrigation system and if necessary turning sprinklers off when they pass over that area, would be implemented.
- 8.54 Mr McIndoe expected there to be no direct adverse effects of irrigation on the Twizel River.

Tekapo River

- 8.55 Mr McIndoe said that the lower Tekapo River flows along the south eastern boundary of the Rosehip Orchards property, between the confluence with the Pukaki River and Lake Benmore. The land to be irrigated is on top of a terrace, about 10 m above the river. At its closest point, the river is approximately 550 m east of the terrace base. At the base of the terrace, there are several wetlands that could be potentially affected by changes to groundwater quality. However, an existing 50-70 m wide fenced buffer strip exists between the top of the terrace edge and the proposed irrigation area.
- 8.56 Mr McIndoe said that runoff would be extremely unlikely on Rosehip Orchards because of irrigation scheme design and the soils.

Ohau River

- 8.57 The Ohau River flows along the most southern boundary of the Rosehip Orchards property, downstream of the confluence with the Twizel River. At its closest, the main channel of the river is approximately 200 m from the property boundaries. Mr McIndoe said that soils along the irrigation area boundary with the Ohau River are Mackenzie series, with good infiltration characteristics and therefore problems with runoff were not expected.
- 8.58 Assuming direct runoff from irrigation is avoided or mitigated, he said that irrigation on Rosehip Orchards has the potential to increase groundwater levels via drainage through the soil profile.
- 8.59 Currently there is no irrigation on the Ohau Flats, although there is a pivot irrigating 200 ha from groundwater on the Twizel Flats.
- 8.60 Mr McIndoe said that Aqualinc (2008) estimated dryland drainage in this area to be in the order of 80-200 mm, depending on soil type. Drainage under irrigation would be expected to increase to 170-300 mm due to additional rainfall drainage and irrigation losses.
- 8.61 Therefore by taking an average of 150 mm for dryland recharge and 250 mm for irrigated recharge, an additional 100 mm of drainage could occur. This equates to 1.1 Mm³/y of additional drainage to groundwater over the Twizel and Ohau Flats.

- 8.62 Mr McIndoe then said that assuming a specific yield of 0.1 for the shallow aquifer material and static conditions, groundwater levels could theoretically rise 1 m over the irrigated area. In practice, he said, groundwater systems are to a large extent self-balancing, and water levels tend to flatten out to reach a new equilibrium, so actual changes he concluded would be significantly less than this figure.
- 8.63 In Mr McIndoe's opinion, a maximum 1 m increase in groundwater levels would have no adverse effects on groundwater in the Twizel and Ohau Flats area. There was only one bore in the area that belongs to Rosehip Orchards, which is used to supply water to the existing pivot.

Effects on Groundwater and Surface Water Quality Twizel Flats

- 8.64 Mr McIndoe said that the Twizel Flats area in the MWRL study was included in the Pukaki River Basin groundwater sub-catchment. With the Twizel Flats area of Rosehip Orchards, the key waterways that irrigation could potentially affect are the lower Pukaki River and the lower Tekapo River – the area above the Tekapo-Pukaki confluence and the lower reach between the Tekapo-Pukaki confluence and Lake Benmore.
- 8.65 In Mr McIndoe's opinion the northern arm of Lake Benmore was in all probability the receiving environment. He told us the piezometric contour map generated by GHD in the groundwater report showed groundwater to be moving south towards Lake Benmore. In the lower Twizel Flats, groundwater from Rosehip Orchards was shown to be moving partly in the direction of the lower Tekapo River and partly in the direction of the Twizel River or Lower Ohau River close to Lake Benmore.
- 8.66 Mr McIndoe said that how much of that groundwater is entering the Twizel River and Lower Ohau River was unknown. The gauging of the Tekapo River commissioned by GHD and by Simons Hill/Simons Pass did not identify any significant gaining or losing stretches between the Pukaki-Tekapo confluence and Lake Benmore. There was no measurable gain in flow. In his opinion that means that contribution of groundwater to the Lower Tekapo River from the Twizel Flats is very small, despite the fact that somewhere between 3.4 and 8 cumecs of water is flowing through the Pukaki sub-catchment.
- 8.67 Mr McIndoe said that the GHD groundwater report showed the Twizel River between the Pukaki Canal at Lake Poaka and the confluence with the Ohau River to be gaining flow from groundwater. What was not clear was where the gains occur and whether the river was gaining in the vicinity of Rosehip Orchards. The Ohau River was not shown to be gaining flow. The Twizel River was the main contributor to the 1.5 km reach of the Ohau River above Lake Benmore.
- 8.68 Because of uncertainty with respect to groundwater pathways Mr McIndoe said it was possible that water draining through the soil profile under the irrigated areas took any of several pathways, viz:
- (a) Drain into deep groundwater, and flow underneath the Twizel River and Lower Ohau River emerging somewhere in Lake Benmore.
 - (b) Drain into shallow groundwater, remain in shallow groundwater and flow into the Twizel River above the Twizel-Ohau confluence.
 - (c) Drain into deeper groundwater and emerge in the lower Ohau River above Lake Benmore.
- 8.69 Mr McIndoe said that the piezometric and groundwater chemistry measurements carried out for Simons Hill/Simons Pass confirmed that shallow groundwater is closely linked to the Pukaki River in its lower reaches. The measurements show that when Meridian is spilling from Lake Pukaki, groundwater levels along the river rise, indicating a movement of water from the river into shallow groundwater and vice-versa when they are not spilling.
- 8.70 Mr McIndoe assumed that if Meridian spills down the Ohau River, the same effect would occur, that there was little gain from groundwater in that area and that Lake Benmore was the main receiving environment. He believed further fieldwork was required to clarify that issue.

Recommended Mitigation

- 8.71 Mr McIndoe concluded by listing his recommended mitigation measures related to irrigation. They were:

- (a) Limit take to flow rates and volumes specified in the applications (monitor using flow meters).
- (b) Adhere to minimum water level conditions in Lake Ruataniwha.
- (c) Have the irrigation system designed according to the INZ Design Code of Practice.
- (d) Implement soil moisture monitoring and use it to operate the irrigation system as efficiently as practically possible.
- (e) Carry out regular visual checks for surface ponding and runoff, particularly on the Edwards soils and implement measures to avoid runoff into streams or minimise runoff in other areas.
- (f) Install drainage lysimeters to monitor drainage volumes and nutrient concentrations.
- (g) Measure and record piezometer water levels along the key waterways.

Transpower Infrastructure

8.72 Mr McIndoe stated in his evidence that the applicant was willing to comply with the condition recommended in relation to this matter. We considered that this addressed the issue.

Dr Ryder – Water quality and aquatic ecology

- 8.73 Dr Gregory Ryder (Director Ryder Consulting) said that Meridian Energy controls the Ohau, Pukaki and Tekapo Rivers for hydroelectric generation. The Ohau River is a residual river channel, and received excess water from Lake Ruataniwha by way of a spillway. The Pukaki River was also a residual channel, and only received occasional water from Lake Pukaki by way of a spillway. As a result of the lack of a constant water source the entire Pukaki River channel was typically dry. The Tekapo River was also a residual channel. However, flows in the lower reaches adjacent to Rosehip Orchards are supplemented by inflows from several tributaries and leakage from the Tekapo Dam.
- 8.74 Dr Ryder said that the Twizel River channel adjacent to Rosehip Orchards contains extensive wetland areas. This wetland area contained several sections of flowing water and large pond areas. There are also several wetland areas adjacent to the Tekapo River channel. These wetland areas are well away from the proposed irrigation area, he told us, and there are no permanent waterways within it.

Water quality

- 8.75 Water quality in Lake Benmore where inflows from the 'Tekapo / Pukaki River' entered the lake was studied by NIWA in the summer of 2008/2009. Dr Ryder noted that the contribution of water from the Pukaki River was often non-existent and insignificant relative to the Tekapo River. Water quality was generally high, with nutrient levels generally well below all guideline levels relevant for a lake-fed waterway, including ANZECC guidelines and the water quality standards recommended by ECan in their review of the NRRP.
- 8.76 GHD (2009) sampled water quality in the Tekapo River above the confluence with the Pukaki River, i.e. upstream of Rosehip Orchards. Nutrient levels for nitrogen and phosphorus were low, with levels generally lower than laboratory detection limits.

Summary of aquatic ecology

Periphyton

- 8.77 Dr Ryder informed us that the invasive algae *Didymo* had been found throughout the Tekapo, Twizel and Ohau Rivers. According to the Biosecurity New Zealand *Didymo* Sample Database, *Didymo* had not been recorded in the Pukaki River. He said that this was likely due to the lack of flowing water in the river channel.
- 8.78 Dr Ryder said that Dr Coffey surveyed periphyton cover and algal biomass at the Tekapo River node in April 2009. Cover levels of thick algal mats averaged over the whole stream reach were well below periphyton cover guidelines. However, cover levels of filamentous algae greater than 2cm long exceeded MfE guideline levels (30%) and those recommended for 'lake-fed' streams by

the ECan report (30%). Algal biomass was considerably higher than MfE guidelines, with average biomass of 106 g/m² (compared to the guideline level of 35 g/m²).

Macroinvertebrates

- 8.79 Coffey also sampled invertebrate communities at the Tekapo River node in April 2009. The community was dominated by 'poor quality' sandfly and midge larvae and 'high quality' *Deleatidium* mayflies. Community health indices were relatively low, and were indicative of 'fair' biotic health.
- 8.80 Dr Ryder said that he expected benthic invertebrate communities in Ohau C Canal would be comprised of similar species as a lake environment, dominated by snails, midges and worms.

Fish

- 8.81 Nine fish species have been identified in waterways adjacent to the Rosehip Orchards area Dr Ryder said that six species are native; lowland longjaw, Canterbury galaxias, koaro, common and upland bullies and longfin eels, with three introduced species; brown and rainbow trout and sockeye salmon.
- 8.82 Lowland longjaw galaxias have previously been recorded in the Ohau River near the site of the proposed irrigation pipeline. However, discussions Dr Ryder had with Peter Ravenscroft from DoC revealed more recent surveys in the area had not found any individuals of this 'nationally critical' species, and Dr Ryder assumed the population was no longer present in the area.
- 8.83 Dr Ryder said that there are no reports of fisheries surveys in Ohau C Canal. However, he expected the fish community is comprised of similar species as in Ohau B Canal, although salmon and trout will likely be less abundant due to the presence of a power station preventing access by adult fish.
- 8.84 Brown and rainbow trout and chinook and sockeye salmon are present in Lake Benmore and utilise spawning grounds in the Ohau and Twizel Rivers, as well as throughout the Tekapo River. The Tekapo River is one of the most popular angling rivers in the Mackenzie Basin.

Potential Effects on Aquatic Ecology

- 8.85 Dr Ryder said that the proposed rate of water take from Ohau C Canal is 560 litres/second. Being an artificial and (more or less straight) channel constructed for power generation, with a regulated flow, Ohau C Canal not surprisingly supports relatively low aquatic values. He considered the proposed take would have no measurable or meaningful effect on the water level or ecological values of the canal.

Irrigation system and application

- 8.86 As there are no permanent waterways within the proposed irrigation area, Dr Ryder believed the effects of installing the proposed irrigation system on aquatic values will be less than minor.
- 8.87 A study by GHD recommended environmental nutrient thresholds for Rosehip Orchards NZ. The threshold set the level at or above which the ecological response to increased nutrients would generate potentially more than minor adverse effects relative to current conditions (based on a 25% increase of calculated periphyton biomass in local streams and rivers above existing conditions being considered a minor adverse effect by GHD). Such an approach was reasonable in Dr Ryder's opinion given the existing status of local waterways and the likely ecological effects of an increase in periphyton biomass in these waterbodies. Further Dr Ryder considered a 25% increase in maximum periphyton biomass over existing levels would be unlikely to result in significant changes to the macroinvertebrate and fish communities in these particular streams.

Recommended mitigation

Water quality

- 8.88 Dr Ryder said that nutrient thresholds have been developed for the farm, under several farm scenarios, to ensure that inputs of nitrogen and phosphorus to waterways do not result in potentially significant adverse effects to local streams and receiving lakes.

- 8.89 Provided these measures are undertaken, Dr Ryder expected changes to water quality would be acceptable and effects of the proposed Rosehip Orchards development on local aquatic ecosystems to be no more than minor.

Riparian management

- 8.90 As there are no permanent waterways in the proposed irrigation area, and the adjacent river beds are located away from the proposed irrigation area, riparian management is not required to protect waterways. Farm mitigation includes requirements to ensure that stock are restricted from any watercourse or open irrigation areas. He said the applicants proposed to mitigate the proximity of the Twizel River to the proposed irrigation area by establishing a conservation area that will provide a separation distance from the irrigation area and the river of at least 200 metres. Dr Ryder believed this buffer distance was appropriate and would contribute to reducing the potential for localised effects on water quality.

Habitat enhancement

- 8.91 Dr Ryder said that the Twizel River channel adjacent to Rosehip Orchards contains large areas of wetland. Also, the Tekapo River channel contains several smaller wetland areas. While these areas are away from the proposed irrigation area, and thus did not require protection or management, their location near Rosehip Orchards presents opportunities for enhancing native wetland habitat. Restoration and enhancement of these areas had the potential to be beneficial for native fish and bird species in the area. Enhancement could include plantings of native vegetation, removal of invasive weed plants and trapping of feral animals.
- 8.92 Dr Ryder said that in his evidence, he had identified that construction activity and the increased intensification of farming associated with the proposed irrigation scheme have the potential to result in greater contaminant losses to ground and surface waters than currently occurs, with potential adverse effects on aquatic communities.

Mr Ogle – Farm Management

- 8.93 Mr Graeme Ogle, Farm Management Consultant, modelled four farming systems for the property. The proposed irrigable area was 610 ha and there is an existing pivot with an area of 200 hectares which has resource consent and does not form part of these applications. The total future irrigated area under pivot is therefore 810 hectares.
- 8.94 Mr Ogle said that the systems modelled for Rosehip Orchards New Zealand Limited, included the two finishing systems described in the decision for Simons Pass Station. The two finishing systems were:
- (a) Lamb finishing, bull finishing and dairy grazing farm (SBFIN).
 - (b) Intensive lamb finishing, bull finishing and dairy grazing farm (SBIFIN).
- 8.95 The two new systems were:
- (a) Lucerne production with lamb grazing and some cropping (Crop15).
 - (b) Bull beef finishing (Bull).
- 8.96 These two new systems are discussed below
- 8.97 He also said that variations were also developed by Dr Val Snow based on his models and are described in her evidence as Luc (lucerne production with no grazing) and Crop10 (based on Crop15 above but without a second year of cropping). These altered the cropping rotations and are covered in Dr Snow's evidence.
- 8.98 The Rosehip Orchards NZ block had Mackenzie soils as defined by the DSIR Land Resources Map 302 (1992). Mr Ogle inspected the soils in 2009 taking soil profile samples at regular intervals. His opinion was these soils are deeper, contain more soil, and less stones than on the east of the Pukaki River where management areas SHS4 and SPS1B are sited. He believed they would perform under centre pivot as described for the deeper soils on management area SPS1A.

Lucerne, Lamb Grazing and some cropping (CROP15)

- 8.99 Mr Ogle said that this option specialises in producing lucerne supplements. During the season three cuts are taken: a hay crop, a baleage crop, and a silage crop. After this, lucerne is left for grazing lambs. It is assumed that the lucerne will have a 10 year life with a break crop rotation of two years between cycles. All crops and lucerne are direct drilled.
- 8.100 The break crop rotation starts with wheat in late autumn which is harvested the following January. A cereal forage crop is then sown. Lambs are purchased through February at 28kg liveweight. These graze the lucerne and cereal during the autumn until mid June. This complements the grazing of the fourth cut of lucerne. Lambs are sold mid June and cereal is shut up for whole crop silage which is harvested before a grain crop is sown in November and harvested in February. The rotation is completed with the establishment of another forage cereal crop in March before establishment of a new lucerne stand the following December.
- 8.101 Mr Ogle said that the only supplementation is provided by the cereal forage during autumn. No nitrogen application to pastures is required.

Bull finishing

- 8.102 He said that this option specialises in bull beef finishing. It was assumed that the area would be intensively fenced for example in a technosystem.
- 8.103 1 Year bulls would be purchased in spring (01 September) at 300kg liveweight. This purchase date matches the start of pasture growth. Bulls would be run at 4.8 bulls per hectare during the growing season (September to April). This relatively high stocking rate was achievable as no bulls are overwintered.
- 8.104 Mr Ogle said that bulls would grow at an average rate of 1.3kg/day. This is near their biological maximum but supported by the quality of feed and time they are being run. Drafting would commence in mid March and would be complete by late April with the average slaughter weight of 308kg carcass weight.
- 8.105 He added that by fitting livestock closely with pasture growth no crops or conserved feed are required. Pasture cover can be maintained by livestock and no hay/silage needs to be made. Nitrogen was applied in early October and again in mid February; both at a rate of 40kgN/ha.
- 8.106 Regrassing – Mr Ogle said that as there was no feeding of supplements during winter, and pasture cover is maintained at optimal levels most of the year, pastures were expected to last considerably longer than other options. A renewal was therefore based on 15 years with grass to grass renewal occurring in spring on 33ha.

Dr Robson – Environmental Scientist

- 8.107 Dr Melissa Robson Environmental Scientist, Ryder Consulting Limited presented evidence on the applicants' Farm Environmental Management Plan (FEMP). Dr Robson's evidence on the purpose and development of FEMPs was covered in Part A of this decision and will not be repeated here. Only evidence specific to Rosehip Orchard Station is considered in this section.
- 8.108 Dr Robson said that a suite of scenarios have been modelled for Rosehip Orchard Station, of which four are presented here; lucerne, lucerne and cropping, finishing and bull beef.
- 8.109 Dr Robson said that the irrigated area of Rosehip Orchard Station, according to the WQS, lies in the Tekapo at Benmore surface water sub-catchment and in the Pukaki groundwater sub-catchment. The local receiving environments for Rosehip Orchard Station that were not considered in the WQS are the wetland areas on the property's western boundary.
- 8.110 Dr Robson also explained the results of the OVERSEER® modelling in relation to the WQS derived thresholds and noted that the applicant's property Nutrient Discharge Allowance (NDA) was within the thresholds set by the WQS even under the models 'highly developed setting'. Consequently, Dr Robson added that no further mitigation would be required should the soils become highly developed.
- 8.111 Dr Robson said that for this farm, the N mitigation requirements are most stringent for the Pukaki Groundwater and there are no mitigation requirements for P, according to the WQS. The WQS thresholds set Rosehip Orchard Station's nutrient discharge allowance at 6,347kg N and 317 kg P per annum.

- 8.112 However, in a subcatchment agreement between those stations (in this consenting process) in the Pukaki groundwater subcatchment, it has been agreed that insofar as possible, a reallocation will occur to enable all applicants to have a degree of flexibility in their proposed farming systems. The subcatchment agreement was outlined by Mr Peter Glasson in his evidence. In this case, the applicant's propose that Rosehip Orchard Station can reallocate any amount of N and P which will be met by other stations' cushion between their OVERSEER® losses and their NDAs. In this case the maximum reallocation has been 15,851 kg N and 170 kg P.
- 8.113 Dr Robson described the Farm Environmental Risk Assessment (FERA) carried out on the Rosehip Property. The risks highlighted were:
- (a) Soils vulnerable to wind erosion, the presence of some bare soils (commonly associated with *Heiracium* infestations), and the presence of some surface capping and consolidation of soils.
 - (b) Stock damage to wet and wetland soils on lower terraces.
 - (c) Stock being fed on the lower terraces.
 - (d) No provisions for fallen stock (scenarios 3 and 4).
 - (e) Direct discharges occurring off the yard.
 - (f) Silage liquor not being collected and spread to land.
 - (g) Direct discharges maybe occurring from the silage pits (scenario 3).
 - (h) Larger than 50 kg/ha applications of N fertiliser (scenarios 1, 2, 3).
 - (i) Late autumn and winter applications of fertiliser (scenarios 1, 2, 3).
 - (j) Soil Olsen P increasing above 25, fertiliser applications on the lower terraces.
 - (k) No suitable storage and filling area being identified.
- 8.114 For all these risks proposed management or mitigation measures were proposed.

Dr Snow – Soil Physicist And Systems Modeller

- 8.115 Dr Valerie Snow presented evidence relating to how OVERSEER® (in combination with other models) as used by MWRL in the Water Quality Study (WQS). We considered this evidence in Part A of our decision, and we do not intend to traverse the same issues here. Rather we consider here the specific evidence Dr Snow presented on behalf of Rosehip Orchards NZ Ltd that have a direct bearing on our decision on this consent.
- 8.116 Dr Snow reiterated that she and Dr Monaghan were of the opinion that OVERSEER® is underestimating nutrient losses from some of the particularly shallow soils in the Basin. This weakness, she explained, can be mitigated by using the "Highly Developed" option in OVERSEER®.
- 8.117 The farm systems modelled for Rosehip Orchards NZ were lucerne, lucerne and cropping, finishing and bull beef. All these farming systems have been modelled, primarily in OVERSEER® but APSIM was used for the lucerne options.
- 8.118 Dr Snow said that the modelling methodology used was environmentally conservative. Where the models used did not permit an exact replica of the proposed farming systems then conservative assumptions were made. Mineral nitrogen remaining in the soil at the end of the cropping cycles was assumed to leach under the HD scenario. Given that the cropping cycles ended in February with a forage crop direct drilled while there was still a reasonably good growing period, it is unlikely that the entire remaining nitrogen will leach.
- 8.119 Dr Snow made the point however that the environmental conservatism did not however lessen the need for best management practice on the property. Given the large area of irrigation proposed and the light soils, she recommended that a high standard of monitoring be maintained.

Dr Steven – Landscape Architect

- 8.120 Dr Michael Steven Landscape Architect said that application site was formally a part of the Orchard Estate Pastoral Lease, which in turn was part of Omahau Station. The site was a triangular area of land bounded by the Twizel Ohau, Pukaki and Tekapo Rivers. It was separated from State Highway 8 by an adjoining property, and is some 7 km distant from State Highway 8. A rough 4WD track down the Ohau riverbed provided access to the delta of the Tekapo and Ohau Rivers and Lake Benmore, beyond the southern boundary of the property. The wider landscape context has been subject to significant modifications through hydro-electricity development, including the establishment of Twizel township, the construction of Lake Ruataniwha, the Ohau Canal and the Ohau A, B and C power stations. An existing centre pivot irrigator was present on the property within which area triticale and lucerne were grown for fodder.
- 8.121 He said that the site was on a relatively flat fluvio-glacial outwash terrace. The terrace has been used for a variety of agricultural purposes, including extensive grazing, but some of the land had been cultivated and cropped. A part of the terrace included an area within which an unsuccessful attempt was made to establish sweet briar (*Rosa rubignosa*) for commercial rosehip production.
- 8.122 The vegetation of the site has been highly modified from its original indigenous grassland cover, Dr Steven said, and displayed the characteristic signs of degradation that were evident on fluvio-glacial outwash plains elsewhere within the basin, particularly *Hieracium* infestation and bare soil. Little evidence of the original short tussock grassland was apparent within the property.
- 8.123 Dr Steven said that except for the landform changes brought about by hydro electricity development, Mackenzie Basin landforms are substantially intact. Vegetative communities and ecological systems had, however, undergone substantial change through direct and indirect human intervention, and the land of the application site provided very clear evidence of such changes.
- 8.124 In Dr Steven's opinion the application site cannot reasonably be considered a highly natural landscape in the biophysical sense of the term, although it did contain unmodified physical elements of naturalness. The property had been subjected to a range of modifications to the natural vegetation. He considered the natural character of the application site spanned the range from Moderate-Low—Moderate—Moderate-High but that overall the site tended towards the Moderate point of the scale.
- 8.125 Dr Steven said that the terrace upon which irrigation was proposed was elevated above the river beds and separated from the rivers by a steep terrace escarpment. The natural character of the rivers had been subjected to various degrees of modification (see Mr McIndoe's evidence).
- 8.126 Dr Steven said that the Twizel River still exhibited a natural flow pattern but the riverbed and its immediate margins had been colonised by exotic trees, predominantly willow. Nevertheless, he said the Twizel River can be regarded as having a significantly higher level of naturalness than the Ohau River adjacent to the site.
- 8.127 Dr Steven then discussed whether the application site could be considered to fall within the margins of these rivers and therefore could be within the ambit of s6(a) of the RMA. His opinion was that all rivers run within channels that are separated from the site by a marked change of level. Agricultural development has already irrevocably changed the character of the terrace and in his opinion the agricultural landscape of the terrace contributed nothing towards what remained of the natural character of the river and its immediate margins.
- 8.128 It was Dr Steven's opinion that the degree of modification and human intervention apparent within the site placed the application site outside the range of naturalness necessary for consideration for s6(b) significance. The natural vegetation communities of the site had been modified by decades of agricultural development, including in recent years, irrigated cropping and an attempt to establish perennial crops of *Rosa rubignosa*.
- 8.129 Within the wider locality of the site, the modifications to the landscape wrought by hydroelectricity development and its related infrastructure, together with Twizel and its infrastructure diminish the landscape significance of the site.

The Irrigation Proposal

- 8.130 Dr Steven said that significant areas within the terrace will remain un-irrigated, particularly land adjacent to the bounding rivers of the property, along the upper margins of the terrace escarpment. Also because the site was so far distant from SH8, visibility was not an issue. It would also not be visible from fishing areas in the vicinity of the delta of the Ohau and Tekapo Rivers and Lake Benmore, he told us.
- 8.131 However as there was public access to the bed of the Twizel River for a range of recreational purposes, Dr Steven believed the application site may be visible from parts of the river bed and from a public walking track (the Twizel River Trail), along the edge of the terrace above the true right of the river, but as a pivot irrigator already exists on RONZ, it was currently part of the users' experience of the trail.
- 8.132 Changes to the biophysical naturalness of the application site will occur but will represent a relatively minor shift, in Dr Steven's opinion.
- 8.133 Despite the minor reduction in naturalness that will accompany irrigation, Dr Steven considered the outcome was an example of circumstances in which human intervention can bring about a more sustainable outcome in terms of natural resource management. The continued colonisation of the lowland landscapes of the Basin by wilding pines, hieracium and other exotic weeds, rabbit infestation and soil erosion, was clearly unsustainable.
- 8.134 In terms of apparent naturalness, the introduction of improved pasture and centre pivot irrigators into the landscape will be perceived by some viewers as diminishing the naturalness of the Basin. A community of opinion holds that irrigation will bring about an unacceptable level of change to the Mackenzie landscapes. The characteristics of the change are considered incongruous and out of context with the prevailing arid, barren environment, Dr Steven considered such views overlooked the extent to which the naturalness of the Basin had been changed over the past 150 years.
- 8.135 As with landscape character generally, Dr Steven considered that the effects on the apparent naturalness of the landscape would be restricted in area and would be offset by the prevailing naturalness of the hill and mountain landscapes of the Benmore Range that provided the dominant background to the site. The naturalness of the wider context would be also influenced by the proximity of the site to the Ohau, Twizel, Tekapo and Pukaki Rivers and Lake Benmore. He considered that the riverine landscapes that bound the site would be influential in maintaining a high perception of apparent naturalness.
- 8.136 The terrace landform of the site was characteristic of the locality, and while subject to little modification, it has had no particular natural science significance in his view.
- 8.137 The short tussock grasslands indigenous to the fluvio-glacial river flats are depleted and there is conspicuous invasion by hawkweed (*Hieracium pilosella*) and *Rosa rubignosa*, and extensive areas of bare earth. As a consequence of modifications by farming and degradation of the original indigenous tussock grassland communities, in Dr Steven's view the site had no biological characteristics or qualities that could be regarded as having significant value.
- 8.138 The braided waterways and associated wetlands of the Twizel, Pukaki, Tekapo and Ohau Rivers are of natural science significance as bird habitat (particularly the Ohau River for black stilt, which breeds in the locality). Land along the margins of the rivers previously part of the pastoral lease has been protected through the tenure review process and added to the conservation estate as part of the tenure review settlement).

Effects on aesthetic attributes

- 8.139 Dr Steven said that of the factors contributing towards the aesthetic appreciation of the landscape, only three factors - apparent naturalness, complexity and ground surface texture - would change to any degree as a consequence of irrigation.
- 8.140 Dr Steven agreed that complexity would increase marginally as uniform colours and textures in the vegetation give way to blocks of different shapes, colours and textures—predominantly circular areas in shades of green.
- 8.141 The addition of centre pivot irrigation structures to the landscape would also contribute a marginal increase in complexity. However, this increase would be from a base that is low in overall landscape complexity.

- 8.142 Ground surface texture is finely grained and offers no apparent impediment to visual access. Dr Steven said that some minor increase in ground surface texture may result, but well within the bounds of what was necessary to maintain high visual quality.
- 8.143 The compartmentalisation of the landscape that comes with the establishment of shelterbelts - sometimes associated with more intensive production - would not occur on the application site due to the practicalities of centre pivot layout and operation.
- 8.144 Dr Steven said that part of the application site was already subject to centre pivot irrigation for fodder crop production.

Effects on landscape character and naturalness

- 8.145 Dr Steven said that the effects of irrigation on the landscape character and naturalness of the application property will vary according to the baseline level of agricultural development. The RONZ application site had been subjected to varying degrees of agricultural development over a long period. The larger part of the application site remained in a degraded state characterised by depleted pasture, hieracium infestation and bare soil.
- 8.146 Dr Steven said that the landscape character of the application site would be transformed by irrigation, from a barren, arid wasteland to productive pasture and cropland. In his opinion, objections to this change were based on a particular landscape aesthetic and uninformed notions of the level of naturalness that prevailed within the site.
- 8.147 Dr Steven explained that irrigation would change the biophysical naturalness of the outwash plain and the shift in naturalness would be from the range Moderate—Moderate-High (Semi-natural) to Moderate— Moderate-Low (Quasi-natural). Improved permanent pasture and crops would replace unimproved mixed grasslands, bare ground and extensive hieracium dominant areas. The invasion of woody weed species will be halted and rabbit infestation would be controlled.
- 8.148 Dr Steven said that the landscape of the Mackenzie Basin was recognised in the Canterbury Regional Policy Statement as a landscape of regional significance. The Commissioners' decision on Proposed Plan Change 13 to the MDCDP acknowledged that while the landscape of the basin was generally outstanding, not all of the Mackenzie Basin was outstanding. The specific question of which areas were outstanding and which are not remained unresolved. In Dr Steven's opinion the application site was clearly within a landscape that cannot be regarded as outstanding, in that it failed the test for naturalness and for landscape significance.
- 8.149 In the event that adjacent landscapes are found to be outstanding Dr Steven did not consider the effects of irrigation on the application site can extend to diminishing the naturalness or landscape significance of adjacent landscapes.
- 8.150 Given the relative remoteness of the application site from public viewing areas, particularly SH8, Dr Steven did not regard the proposed irrigation of the site as being a contributor to cumulative effects. In his opinion the site was scarcely visible at all, and would not be seen sequentially with other irrigation sites, nor would it be seen cumulatively with other irrigation sites.
- 8.151 In Dr Steven's opinion there were neither localised effects nor cumulative visual and landscape effects arising from this proposal that could be regarded as adverse and requiring mitigation.
- 8.152 Dr Steven said that the issues raised by Mr Glasson that are specific to the site were:
- (a) The "significant adverse landscape effects" of undertaking irrigation in a "spotty and discontinuous manner". Dr Steven's opinion was that this effect, assumed by Mr Glasson to be significantly adverse, was more imagined than real and required no mitigation.
 - (b) The absence of existing buffer between the Pukaki, Tekapo and Twizel Rivers and delta, and the proposed irrigated land will create significant landscape effects that require mitigation.
 - (c) The northern boundary of the site should be "more compatible with the landform."
- 8.153 Dr Steven said that it was not clear from Mr Glasson's report what the suggested buffer between the terrace risers (escarpment) and the irrigation area was meant to be buffering, nor what the "significant adverse effects" are that required mitigation. The indicative centre pivot layout diagram showed that the irrigated area would approach the upper edge of the escarpment at a

limited number of locations, and that extensive areas of the upper escarpment edge would be un-irrigated. This he said was the inevitable outcome of fitting circular forms into a polygon of land.

- 8.154 Dr Steven also believed that it was not necessary to provide a greater depth of buffer between the delta of the Ohau and Tekapo Rivers and the irrigated land of the terrace. He said that there was a considerable horizontal and vertical distance between the area of the terrace proposed for irrigation and the river deltas. The terrace proposed for irrigation was raised above the level of the Ohau and Tekapo riverbeds, and the terrace escarpment separating the two levels was a significant buffer of itself. The circular nature of the pivot layout means that the southern tip of the terrace would remain un-irrigated and would effectively serve as a buffer.
- 8.155 The suggestion that the northern boundary of the site should be more compatible with the landform made no sense to Dr Steven. The northern boundary of the site is a straight property boundary line across flat land. He assumed Mr Glasson was referring to the boundary of the irrigated areas and the adverse effects that supposedly stem from the proposed irrigation layout at the northern boundary are not explained. In his opinion this was a spurious effect of no concern.
- 8.156 Given the relative remoteness of the application site from public viewing areas, particularly SH8, Dr Steven did not regard the proposed irrigation of the site as being a contributor to cumulative effects. The site was scarcely visible at all, and would not be seen sequentially with other irrigation sites, nor would it be seen cumulatively with other irrigation sites, other than from the air. In his opinion, the visual effects of centre pivot irrigation when viewed from the air are not a legitimate matter for landscape assessment.
- 8.157 Dr Steven rebutted Ms Yvette Rodrigo's (s42A officer) opinion that section 6(b) of the RMA was a relevant consideration, because the irrigation proposal will change the visual aesthetics of the landscape in an area of high amenity. Dr Steven's view was that the RONZ site cannot be regarded as being part of an outstanding natural landscape as it failed the tests for both naturalness and significance.

FEMP

- 8.158 Dr Robson presented evidence on the FEMP, but as it has been presented as part of the applicant's case, and for consistency with other decisions, we briefly comment on it in this section.
- 8.159 We note that Mackenzie soils cover all the proposed irrigation area and that these are described as predominantly shallow and stony and excessively to somewhat excessively well drained.
- 8.160 Table 3 of the FEMP presents the results of OVERSEER®/APSIM modelling for the applicant's proposed farming systems. We note that the NDA based on the most stringent nutrient mitigation requirement identified in the WQS (Pukaki groundwater) is only met through invoking a subcatchment agreement (between applicants) to reallocate surplus capacity (from other applicants below their NDAs). Otherwise the modelled nitrogen load is more than double the NDA for the Lucerne with lamb finishing option and the cropping option on using the developed setting, and ~3 times the NDA using the highly developed setting. The NDA is also exceeded for the other options.
- 8.161 Proposed mitigation measures include not applying fertilizer within 20 m of a watercourse or within 50 m of a bore. No specific measures (such as nitrification inhibitors that were promoted by MWRL) were proposed to mitigate N leaching. No specific changes to farm management were proposed in response to a monitoring breach.

9 SUBMITTERS

Landscape

- 9.1 The evidence of Ms Lucas and Dr Walker on behalf of the McKenzie Guardians criticised the potential adverse landscape effects of the Rosehip applications. Ms Lucas said that the existing development had disrupted the outwash landscape unit and that expansion across the proposed site would exacerbate these effects. Ms Lucas said that Mr Glasson recommended buffering to the rivers, the terrace risers and the delta. In her opinion, however, the buffering would not adequately protect the integrity of the natural landscape values. The existing irrigation within the landscape unit was a legible disruption which, with expansion, would threaten the integrity of the natural landscape values. Ms Lucas was of the view the application should be declined.

- 9.2 Ms Ann Steven in her evidence also described the panoramic views of the basin floor in the Twizel-Pukaki area that can be enjoyed from the walking track up the northern flanks of the Benmore Range where the basin floor forms an impressive, broadly homogenous and natural-looking foreground to the expansive views of the Alps and Lake Pukaki. The Pukaki Flats, which are included within this application site, form much of this natural-looking floor basin, she told us.

Terrestrial ecology

- 9.3 Dr Walker in her attachment 15 noted that as a result of the tenure review survey terrestrial biodiversity values had been mapped. She provided comments on existing biodiversity information and set out her reasons for concern. As we understood them, she noted that the site was adjacent to RAP, namely P-15 (Tekapo/Pukaki and Ohau Riverbeds) and a SSWI and WERI¹. She referred to wide braided alluvial riverbeds providing important habitat for waterfowl, waders, passerines and aquatic and terrestrial insect fauna. We did not understand her evidence to be directed at the command area itself, but rather her concerns were focusing on the riverbed areas and areas immediately adjacent to them.

Hydrological Issues

- 9.4 Mr Callander for Meridian set out his conclusions made in relation to whether, or how much, of the groundwater from the Rosehip properties ends up in the Twizel or lower Ohau Rivers. He pointed out *that*

"Mr McIndoe acknowledges gains in flow in the Twizel River and lower Ohau River, and accepts there was uncertainty as to how much groundwater contribution there might be (para 283). He relies on the GHD assessment to conclude that the effects are likely to be minor. However, in recognising the lack of data described in paragraph 283, this was not a conservative conclusion."

Cultural Matters

- 9.5 The evidence of Paul Horgan stated that Ngai Tahu are specifically opposed to the Rosehip applications as part of a group of applicants whose activities may have adverse effects on the Tekapo River and Haldon Arm of Lake Benmore.
- 9.6 Ngai Tahu's concerns are principally centred on the potential degradation of the surface water bodies in the area, particularly where they include habitats where mahinga kai was traditionally gathered or might be enhanced.
- 9.7 Ngai Tahu engaged an ecologist Ms Diana Roberston to prepare evidence on the ecological effects of the Upper Waitaki applications on the Ahuriri Delta and Haldon Arm of Lake Benmore. The Ngai Tahu approach to the Upper Waitaki applications was to identify two focal points against which to assess all the applications. That process linked with a prior decision that identified the Ahuriri Delta and Haldon Arm of Lake Benmore as sites for enhancement of mahinga kai.
- 9.8 Ms Robertson's conclusions were that the assessments provided by MWRL WQS were insufficient to determine the likely effects of the irrigation proposals on the Haldon and Lower Tekapo. She also submitted that based on some of the submitter experts (Meridian and DoC) that there is significant risk of adverse effects on the water quality at the (Ahuriri) and Haldon Arm.
- 9.9 Ms Mandy Waaka-Home in her evidence for Ngai Tahu emphasized the importance of tuna (eel) stocks to the relationship Ngai Tahu have with the Upper Waitaki catchment. Ms Waaka-Home submitted that the Haldon Arm was a strategic point for regenerating tuna stocks and also providing "hands on relationships" for Ngai Tahu with their taonga.
- 9.10 The applicant, along with High Country, Simons Pass and Simons Hill actively engaged with Ngai Tahu representatives to discuss and identify ways to address the concerns of Ngai Tahu. Ngai Tahu remained formally opposed to the applications on the Pukaki Flats, however they stated that if in the event consents were granted Ngai Tahu would be in support if conditions included the adoption of a staged implementation of irrigation developments.
- 9.11 Consultation with Ngai Tahu focused on Simons Hill and agreed to the establishment of a mahinga kai enhancement area on Simons Hill property adjacent to the Tekapo River.

¹ These stand for Wetland of Regional Importance and Site of Special Wildlife Importance, being classifications developed by the Department of Conservation as indicators of areas with some significant ecological value.

- 9.12 The Ngai Tahu position is most notably concerned with the effects of new applications that also involve dairying, plus the cumulative impacts of 25,000 hectares of new irrigation in the catchment on water quality.
- 9.13 The location of the irrigated block above the Haldon Arm and bounded by the lower reaches of the Tekapo and Twizel Rivers has the potential to impact on an area of strategic importance to the mahinga kai interests of Ngai Tahu.

10 UPDATES TO THE SECTION 42A REPORTS

- 10.1 Ms Rodrigo summarised the amendments to the proposal made during the hearing, including the reduction in the volume of water applied for and the size of the irrigation area. Ms Rodrigo said that, notwithstanding these changes, the conclusions and issues raised in the s42A report still applied to the proposal.
- 10.2 Mr Glasson in his addendum report concluded there was no change from his original report and he remained of the view that irrigation would have less than minor adverse effects on the landscape.

Surface Water Quality

- 10.3 The draft FEMP and water quality assessment provided by Dr Robson, and MWRL, had been audited by Environment Canterbury's technical experts. For CRC072118, they consider that there are some uncertainties about the potential adverse effects and suggest that either more information is needed or strict monitoring and response conditions would be needed to address cumulative water quality effects.
- 10.4 In addition, Mr McNae in his s42A report had identified a number of inputs used in the OVERSEER model for the site that require clarification in order to confirm the validity of the results of the model.

Cultural Values

- 10.5 Mr Peter Glasson outlined the consultation undertaken with representatives from Ngai Tahu and the three local runanga (Te Runanga o Arowhenua, Te Runanga o Waihao and Te Runanga o Moeraki) in his evidence. Mr Glasson has not provided confirmation however, whether Ngai Tahu or any of the runanga consulted with were satisfied with the mitigation proposed by the applicant. Given that Ngai Tahu had not presented evidence at the hearing at the time the updates to the s42A reports were completed, the reporting officer could not confirm whether there were still remaining concerns or whether the mitigation proposed by the applicant was acceptable.

11 APPLICANT'S RIGHT OF REPLY

- 11.1 Kelvin Reid Counsel for the Applicant in reply said the Applicant had presented a range of farm-use options in their consent application. This allowed them a degree of flexibility in developing a farm system that was both suited to the land and profitable from an economic and capital perspective. Consent was sought for the full nutrient budget agreed in the Pukaki sub-catchment agreement which would enable any of the whole range of options presented to be developed. All options were predicted to be within the nutrient budget for Rosehip Orchards. He added that the land use challenges facing farming in these areas had been, and continue to be, very significant and this had very much driven this approach by the Applicants.
- 11.2 The conditions suggested by MWRL include:
- (a) The lock-step approach to verification of the MWRL groundwater science.
 - (b) The environmental baseline monitoring.
 - (c) The staging approach to irrigation development.
- 11.3 Mr Reid said that the Applicant had adopted a very conservative approach to developing the land use options and to assessing those options in relation to the nutrient thresholds in place for the property. All modelling was undertaken at the highly developed status to ensure that they would be well under the WQS threshold and therefore a very conservative approach to environmental management was proposed; the development would be undertaken in a staged approach, as set

out by the MWRL, the full suite of MWRL conditions would apply to any consent granted; and the applicant had proposed additional conditions relating to the imposition of fish screens.

- 11.4 In terms of the technical reports by the reporting officers, Mr Reid said that the Applicant believed there were no outstanding issues in relation to this property that had not either already been addressed or was able to be adequately addressed through the stringent regime of monitoring and mitigation that was proposed in the condition suite.
- 11.5 Mr Reid said that the most recent addendum report of Dr Freeman had classified the water takes for both properties as "amber". Mr Freeman's description of the amber category stated that it includes:

*"those that, on the basis of the currently available information, had significant uncertainties about potential adverse effects on cumulative water quality and depending on additional consideration relating to issues other than cumulative water quality effects **could be granted**, provided that either more information is obtained to reduce the uncertainties and/or subject to strict comprehensive monitoring and response conditions that would enable a rapid and effective control response that would adequately prevent the occurrence of significant adverse effects."*

- 11.6 Mr Reid noted that, the applicant was proposing to adopt the full suite of MWRL monitoring and mitigation conditions, including that monitoring proposed prior to the implementation of the irrigation. They were committed to a staged approach to their development in order to provide another level of protection should any unexpected adverse effects occur.
- 11.7 Mr Reid acknowledged that Mr McNae (audit of OVERSEER® inputs) was initially concerned about an apparently very high stocking rate, use of the applicants own irrigation nutrient concentrations (as opposed to the default concentrations), and apparently high pasture production rates.
- 11.8 Mr Reid said that for all these matters, Mr McNae was provided further explanations. A detailed summary of those explanations was presented in the attachments to Mr McNae's addendum report. He concluded that report by saying *"Overall there is a strong level of confidence that the completed modelling provided a reasonable representation of future nutrient loading."*

12 STATUTORY CONTEXT

- 12.1 The relevant statutory context is set out in detail in our Part A decision. In accordance with those requirements, we have structured this evaluation section of our report as follows:
- (a) Evaluation of effects
 - (b) Evaluation of relevant planning instruments
 - (c) Evaluation of other relevant s104 matters
 - (d) Part 2 RMA
 - (e) Overall evaluation

13 EVALUATION OF EFFECTS

- 13.1 Drawing on our review of the application documents, the submissions, the Officers' Reports, the evidence presented at the hearing and our site inspection, we have concluded that the effects we should have regard to are:
- (a) Groundwater issues
 - (b) Water quality
 - (c) Landscape effects
 - (d) Terrestrial ecology
 - (e) Cultural effects

Groundwater

- 13.2 There is one major issue that has significant consequences that remains unresolved. Mr Callander for Meridian, set out his conclusions made in relation to whether, or how much, of the groundwater from the Rosehip property ends up in the Twizel or lower Ohau Rivers. He pointed out *that*

"Mr McIndoe acknowledges gains in flow in the Twizel River and lower Ohau River, and accepts there was uncertainty as to how much groundwater contribution there might be (para 283). He relies on the GHD assessment to conclude that the effects are likely to be minor. However, in recognising the lack of data described in paragraph 283, this was not a conservative conclusion."

- 13.3 Mr Reid in his reply said that the lack of groundwater data could be overcome by using a staged development and rigorous monitoring.
- 13.4 We agree with Mr Callander that Mr McIndoe's conclusion with respect to groundwater pathways from the irrigation area is not conservative. In our view the evidential base for most leachate going to deep groundwater and thence directly to Lake Benmore is flimsy. We do not agree that the work carried out for Simons Hill/Simons Pass stations shows little inflows to the Lower Tekapo River (in the vicinity of the site). There is evidence of significant interaction between surface- and ground-waters in this region and there are likely to be, in our view, gaining and losing reaches over relatively short distances. Moreover, the effects of raising the local groundwater table in the irrigation area (as acknowledged by Mr McIndoe) on such gains and losses is not understood, and needs to be in order to have more confidence that leachate will not be discharged into the rivers.
- 13.5 Other information that impact on our disquiet about groundwater paths are:
- (a) The "excessively drained" soils on the proposed irrigation area as tabled in the FEMP, combined with the likelihood of impermeable boundaries at some depth, and,
 - (b) The close proximity of the proposed irrigation area in relation to the Twizel, Tekapo, and Lower Ohau Rivers with little information on the likely flow paths to each, and how that might be impacted by irrigation on different parts of RONZ.
- 13.6 In our view, the conservative assumption is that the majority of leachate from the proposed irrigation areas will emerge within a riverine environment (as opposed to Lake Benmore) and we have used this assumption in our consideration of water quality issues below.

Water quality

- 13.7 In Part A of this decision we rejected the MWRL proposition that all consents sought in this hearing could be granted (with conditions) and without causing cumulative effects. It is incumbent upon us, therefore, to consider (as far as is possible) whether granting this application, in combination with other water permits we grant, will lead to cumulative water quality effects. In this case it means considering the potential effects of granting this application (in combination with others we grant) on:
- (a) the trophic state of the Haldon Arm of Lake Benmore,
 - (b) groundwater chemistry and in particular the MWRL-proposed threshold of 1 mg/L nitrate-nitrogen (NO₃-N), and
 - (c) periphyton growths in the Twizel, Tekapo, and Lower Ohau Rivers.
- 13.8 The applicants have proposed various mitigation measures to lessen the risk of their activities contributing to cumulative water quality effects. We need to consider whether the proposed mitigation measures and adaptive management scheme are sufficient to avoid a significant water quality problem occurring, and/or whether refinements to the measures proposed are required.
- 13.9 There are no surface waters within the proposed irrigation areas so there are no local water quality effects to consider, except the effects on the Twizel, Tekapo, and Lower Ohau rivers that can be attributed solely to the applicant's activities.

- 13.10 The ultimate receiving water (as far as this application is concerned) is the Haldon Arm of Lake Benmore. In Part A we determined that the Haldon Arm of Lake Benmore can assimilate an increased nutrient load from the granting of consents (with mitigation) and remain within an oligotrophic state. While we did not accept the MWRL proposition as a whole (that all consents could be granted) we did accept that the proposed (MWRL) increased nutrient load from irrigation would not cause a more than a minor effect to the Haldon Arm of Lake Benmore; mainly because of the high inflows from the Ohau B canal and the concomitant relatively short residence time.
- 13.11 We have also accepted the proposition that effects of irrigation on groundwater may be considered minor where the NO₃-N concentration remains < 1 mg/L. This appears to be a reasonable interpretation of the PNRRP objectives for groundwater in the Mackenzie Basin, and there has been no challenge to it. No evidence on predicted groundwater concentrations was presented specific to this application, however, if this were our sole water quality concern it could be met through consent conditions.
- 13.12 As was noted by Mr McIndoe however, the purpose of the NO₃-N groundwater provisions in the PNRRP is to protect surface waters. In this regard we are of the view that there is a significant risk that the proposed irrigation will result in nuisance growths of periphyton in the Twizel and/or Tekapo River adjacent to and downstream of the applicant's property. We are also concerned about similar effects in the Lower Ohau River, but note that this river is already highly modified, does not have the same values as the Twizel, and only borders the property at the south-western edge.
- 13.13 The reasoning behind our concerns is as follows:
- (c) In Part A we rejected the MWRL proposition that we should allow a 25% increase in periphyton above that calculated as the current biomass in the WQS. Apart from its arbitrary development, we are of the view that to accept the 25% increase guideline is contrary to the PNRRP; and the operative (11 June 2011) NRRP, which both have objectives to maintain or improve effects related to water quality, and not permit a degradation. As noted in Part A we are of the view that the MfE periphyton guidelines are applicable in the Mackenzie Basin environment and should be used.
 - (d) The WQS calculated that Pukaki groundwater required the most stringent mitigation for nutrient leached from the applicant's proposed irrigation. If the MfE periphyton guidelines had been used as the basis for determining whether nuisance growths of periphyton could occur, then, in our view it is very likely that the Twizel River and/or Tekapo Rivers would have required even more stringent nutrient mitigation than Pukaki groundwater, and consequently the NDA for the property would have been reduced.
 - (e) As discussed above the groundwater evidence is equivocal, and we are not convinced that drainage water from the applicant's property will bypass the Twizel and/or Tekapo Rivers.
 - (f) The evidence of Dr Coffey (MWRL) and Dr Ryder (the applicant) showed that periphyton growths in the Lower Twizel already exceed MfE guidelines on some occasions. As noted in Part A, we did not accept Dr Coffey's view that these periphyton growths are unrelated to existing irrigation activities. In the context of this application, we note that there is existing irrigation upstream of the Twizel lower node, which could explain these growths.
 - (g) Dr Romero's (MWRL) evidence pointed to the likelihood of phosphorus limitation in Lake Benmore, although this is with respect to phytoplankton in the lake. However, the nutrient limitation experiments of Wilks and Norton (reported in part A) showed that periphyton growth in the Twizel River (experiments not done in the Tekapo R) was co-limited by nitrogen and phosphorus (i.e. It responded to both N and P additions). We note that with the farm management options presented by the applicant (except the finishing options) the calculated NDA for P would not be met without invoking the subcatchment agreement to reallocate nutrient allowance to other stations.
 - (h) We are of the view that the subcatchment agreement to reallocate nutrient allowance would not be effective where periphyton growth in rivers required the most stringent nutrient mitigation. For the reallocation agreement to be effective, the stations to which the nutrient load was being reallocated would need to be contributing to the cumulative effect. That is unlikely to be the case in this instance as the proposed donator of nutrient allowance (Simons Hill/Simons Pass) do not contribute directly to the Twizel River; and they argue, their own nutrient leaching bypasses the Tekapo River as well.

- (i) Thus returning to point (e) above, we are of the view that even small increases in phosphorus leaching (predicted by the applicants calculations) could cause significant increases in the nuisance periphyton growths. The free draining stony soils (characteristic of the property) are unlikely to adsorb significant quantities of phosphorus, which is expected on more developed soils. Similarly the significant quantities of nitrate predicted to be leached from the irrigated property is likely, in our view, to contribute to nuisance periphyton growths.
- (j) This application would, if granted, cumulatively contribute to periphyton effects in the Lower Twizel River.
- (k) The Lower Twizel and Tekapo Rivers are highly valued recreational water bodies and significant increases in periphyton growth would affect these values.
- (l) Ngai Tahu has identified the delta of the Haldon Arm and nearby tributaries as a site suitable for mahinga kai enhancement. We are of the view that further nuisance growths of periphyton would degrade habitats and deny opportunities for enhancements.
- (m) We are not convinced that the mitigation measures proposed by the applicant through the FEMP would significantly reduce the risk of nuisance periphyton growths occurring in the Lower Twizel, Tekapo, and Ohau Rivers.

Adaptive management

- 13.14 The applicants have adopted the MWRL position of overcoming some of the uncertainties raised by way of adaptive management, whereby they will develop their property in stages and only proceed where certain milestones are met (thresholds not exceeded).
- 13.15 As discussed in Part A we are of the view that adaptive management is not a substitute for an inadequate assessment of environmental effects. We acknowledge that an AEE can have, and will have uncertainties, and it is not incumbent on the applicant to eliminate these uncertainties. It is matter of judgement, however, as to whether an AEE adequately addresses the likely environmental effects arising from the application. In our view, by solely adopting the MWRL general AEE, the applicant has failed to address site specific issues relating to the geography and geo-hydrology of their property and the activity they propose, in relation to the Lower Twizel and Ohau Rivers, which are in close proximity.
- 13.16 In addition, the applicants committed to the "lock step" approach to verification of the MWRL science. The lock-step approach in essence, includes the design and implementation of a pre-irrigation monitoring programme. Simply put, if the baseline assumptions are not confirmed through this monitoring, then irrigation cannot commence.
- 13.17 While attractive at first blush it raised for us the question: Why should consent be granted in the circumstance where what we considered to be fundamental pre-consent research was either not completed or not completed adequately?
- 13.18 Our concern with this approach is that while we see the sense in the circumstances of this case of pre-irrigation monitoring, we note that, firstly, it is more than pre-irrigation monitoring; indeed, it is the design and implementation of a pre-irrigation monitoring programme.
- 13.19 Next, if we are to grant consent on this basis, then our view of the evidence produced there is a very real risk the applicant group would not be able to proceed beyond the pre-irrigation monitoring programme. Rather than grant a consent that could not be given effect to and which might create difficulties for both the applicant group and the consent authority, we considered it more appropriate that we recognise, through declining consent, that the applicant bears the primary responsibility of coming to a hearing with adequate information.

Landscape effects

- 13.20 In our Part A decision we summarised the evidence of a number of landscape experts who expressed differing views the effects that irrigation would have on visual effects. We reached some general conclusions on the issue and set out our general approach for assessing landscape effects for individual proposals. We now move on to apply this assessment approach to the current proposal.

- 13.21 We have earlier described the existing landscape in our discussion of the officer reports and the evidence presented. We record there was a level of commonality about the key features of the existing landscape between the various landscape witnesses we heard from.
- 13.22 The changes to the landscape we considered that would occur as a result of a grant of consent would be the presence of the pivots and the greening of the landscape. Both Dr Steven and Mr Glasson were in agreement that the significance of these changes would be no more than minor.
- 13.23 They arrived at that conclusion largely, we thought, because the command area for the irrigation has been significantly reduced and it is not visible from viewing points and, in particular, from State Highway 8. Ms Lucas, in particular, held a contrary view and considered that no irrigation should occur in this site. In her evaluation, we did not think that she placed sufficient weight on the modifications to the landscape, which Dr Steven so carefully described for us. For example, she did not take into account the existence of the irrigator pivot, which was already in place, and the effects it gave rise to. Also, we do not think she placed sufficient weight on the fact of the existing farming activity and previous development of the site as described earlier by Mr Lyons. It seemed to us that she took a much broader view of the Pukaki Flats without concentrating on the particular landscape characteristics of the subject site.
- 13.24 So we concluded in the end that we were more comfortable with the approach to the significance of the changes brought about by grant of consent as undertaken by both Dr Steven and Mr Glasson.
- 13.25 A useful reference point when considering the significance of the change is how the landscape is treated in the relevant district plan. We say this because the CRPS and the PCRPS provide that the entire Mackenzie Basin is an outstanding natural landscape and should be protected from inappropriate use and development. The protections, if appropriate, should be afforded through the relevant district plan.
- 13.26 In respect of this particular application, the Mackenzie District Plan is the relevant district plan. The site is zoned Rural in terms of the Mackenzie District Plan. The Rural zone has a range of policies and objectives but, in terms of landscape values, Objective 3 appears to be the most relevant. Objective 3 of the Mackenzie District Plan seeks protection of outstanding landscape values, natural character of margins of lakes, rivers and wetlands, and those of natural processes, and elements that contribute to the district's overall character and amenity. There are other policies and objectives but all appear to be, to us in any event, relatively general in their approach. Mr Glasson was of the view that Objective 3, in particular, reinforces what he described as the "*technical view*" that significant parts of the Mackenzie Basin have outstanding landscape values.
- 13.27 We do note Ms Rodrigo in her principal s42A report noted that the area was classified as an area of outstanding regional significance. We took this to mean a reference to the CRPS and PCRPS in terms of classifying the Mackenzie Basin as an outstanding natural landscape.
- 13.28 Overall, we have taken the view that Dr Steven's position is to be preferred in terms of his assessment that the application site cannot be reasonably considered as a highly natural landscape nor does it contain modified physical elements of naturalness. This is largely because of a history of agricultural activities occurring on the site. We also accepted his view that when considered in a holistic sense the overall effects on the natural character of this portion of the Basin would be slight.
- 13.29 In terms of the greening effects referred to, we agreed with Dr Steven that changes in vegetative communities have occurred throughout New Zealand wherever farming is practiced. We can find support for this view from the Mackenzie District Plan in that it provides for farming activities.
- 13.30 Given the changes that have occurred to this application over time, like Mr Glasson we are satisfied that the issues of concern (in terms of views and amenity effects from vantage points), both in terms of the irrigation agriculture and greening effects, can now properly be described as minor. We accept Dr Steven's view that this particular site while part of an outstanding natural landscape is not of itself an outstanding natural landscape. Further, we have formed the view that the form of development here proposed would not be an inappropriate use and development of the subject site.
- 13.31 Thus we consider the proposal could proceed without compromising landscape or amenity values. However, this conclusion must be considered in combination with our findings on other issues, particularly water quality, to inform an overall evaluation as to whether consent should be granted.

- 13.32 In reaching our conclusions in terms of landscape values we have taken into account the potential cumulative effects of this proposal. We note Mr Glasson's view that if all of the application sites within his Landscape Unit 3 – Pukaki were approved in the form that they were lodged, then he reaches a conclusion that there would be adverse cumulative landscape effects for this Landscape Unit.
- 13.33 However, he notes that if the mitigation measures that he proposed within his principal report were adopted for all of the individual sites, then there would be no adverse cumulative effects for this Landscape Unit.
- 13.34 For our part, our conclusions remain unchanged irrespective of whether we are considering this application in isolation or in combination with other existing and future developments. For this reason and given our overall findings on this application, we have not provided a detailed consideration of cumulative landscape effects within this Decision.
- 13.35 We do note that the Tekapo River and the Ohau River are recognised as sites of natural significance under the Mackenzie District Plan. We return to this issue when we undertake our s7 evaluation.

Terrestrial Ecology

- 13.36 While Dr Walker's evidence and overall analysis was helpful, it took a basin wide approach as distinct from a detailed analysis of application sites and/or command areas. We did find her Appendix 15 of value where she sought to link her overview with some details around proposal sites. In this application, as we noted earlier, we understood her evidence to be focussing on the river bed areas and areas immediately adjacent to them, rather than the command area itself. It was therefore of limited relevance in our considerations.

Cultural effects

- 13.37 The current Ngai Tahu position is to oppose the proposal based on their perception of uncertainties surrounding aspects of the application, particularly with respect to water quality and groundwater and the likely flow-on effects to mahinga kai. The applicants, for their part have proposed a staged approach and adaptive management in order to address these uncertainties. We need to decide whether the applicant's proposal convinces us that more than minor effects on mahinga kai can be avoided, remedied, or mitigated.
- 13.38 Our view is that Ngai Tahu's position with respect to this application, based on their perception of uncertainties surrounding water quality and groundwater and the likely flow-on effects to mahinga kai, is well-founded. As discussed above, we are of the view that there are significant risks from this application to invertebrates, and freshwater fish. While it is unlikely that increased periphyton growths would affect tuna (eel) directly, an indirect effect on the food chain cannot be discounted.

Key conclusions on effects

- 13.39 In relation to the actual and potential effects of the proposal, our key conclusions are as follows.
- 13.40 We agree that there are no longer "take issues" given the applicant agreed that the proposed take will be subject to the minimum lake levels in Lakes Pukaki and Ohau as specified in Table 4 WCWARP.
- 13.41 We are satisfied that there will not be visual amenity and landscape effects arising from a grant of consent for the application as now amended by the inclusion of the applicant's mitigation measures as supported by Mr Glasson.
- 13.42 We think that the main impact on terrestrial ecology would be, as we have noted earlier, through nuisance growths of periphyton, which could affect aquatic invertebrates and consequently fish and birds.
- 13.43 The key principal issue in contention was to do with groundwater effects and consequently water quality and instream ecology. We were faced with competing views between Mr McIndoe and Mr Callendar. For reasons we have already discussed, we prefer the views expressed by Mr Callendar in relation to groundwater flow paths. We do acknowledge that in the materials advanced by Mr McIndoe he was candid to acknowledge the dearth of sufficient information and data so as to be confident about the flow path of drainage from the application site. In short, we conclude Mr McIndoe did the best he could with the material he had available. However, that

lack of quality data in the end, we think, countered against the proposition he advanced. So our main finding on this point is that we prefer the evidence of Mr Callendar on the issue of groundwater effects and flow; that, ultimately, the application suffers fundamentally from a lack of quality data and information to enable us to be confident about flow path of drainage water from the application.

- 13.44 Our further finding is that there is a very real risk of further proliferation of periphyton in the Twizel, Tekapo and Lower Ohau Rivers, which would be unacceptable. Such an outcome would have adverse effects on native fish populations, birds and the ecosystem.
- 13.45 The response to this circumstance put forward by the applicant was to utilise adaptive management and a stepped approach to the activity. Both adaptive management and a stepped approach would be founded in conditions of consent. However, we have reached a finding that given the consequences on the environment are so great if the adverse events we have signalled do occur and given the troubling paucity of data, we do not think this is a circumstance where adaptive management coupled with a stepped approach is inappropriate to implementing the consent.
- 13.46 We are of the view that the use of water for irrigation could result in more than minor effects on water quality and aquatic habitat of the Twizel, Tekapo and/or the Lower Ohau Rivers. In particular we believe that nuisance growths of periphyton that exceed MfE periphyton guidelines are likely in these watercourses, and that this would result in a decline in aquatic habitat. The applicant has, in our view, not offered sufficient mitigation that convinces us that the water quality and aquatic environment of the Tekapo, Twizel and Lower Ohau Rivers will not be affected in a more than minor way.
- 13.47 As a consequence of the effect on water quality, we consider that granting consent to the proposal would have adverse effects on mahinga kai and cultural values.

14 EVALUATION OF RELEVANT PLANNING INSTRUMENTS

- 14.1 Under s 104(1)(b) of the Act, we are required to have regard to the relevant provisions of a range of different planning instruments. Our Part A decision provides a broad assessment of those planning instruments and sets out the approach we have applied to identification and consideration of the relevant provisions. The following part of our decision should be read in combination with that Part A discussion.
- 14.2 In relation to the current application, we consider that the most relevant and helpful provisions are found in the regional plans, including in particular the WCWARP and the NRRP. In addition, the Proposed and Operative CRPS and the relevant District Plans are of assistance in relation to landscape issues that arise.
- 14.3 The following sections of this decision provide our evaluation of the key objectives and policies from these planning instruments. We have organised our discussion in accordance with the key issues arising for this application, which are water quality, tangata whenua, environmental flow and level regimes, efficient use of water and landscape values.

Water quality

- 14.4 In relation to water quality, the key documents we have considered are the WCWARP (incorporating the objectives of the PNRRP) and the operative NRRP provisions.
- 14.5 In relation to the WCWARP, we consider that Objective 1 is the critical objective. In particular, Objective 1(b) seeks to safeguard life supporting capacity of rivers and lakes. We have determined that granting this consent is likely to result in nuisance growths of periphyton in the Twizel and Tekapo Rivers that exceed MfE periphyton guidelines and that this would result in a decline in aquatic habitat. Therefore the life supporting capacity of these water bodies will be compromised, which is contrary to Objective 1(b).
- 14.6 Objective 1(c) requires us to manage waterbodies in a way that maintains natural landscape and amenity characteristics and qualities that people appreciate and enjoy. Given our finding in terms of the likely results in the Twizel and Tekapo rivers, then in our view granting consent would not be consistent with Objective 1(c).
- 14.7 We note that Objectives 2, 3, 4 and 5 'in the round' deal with and provide for the allocation of water. However, the critical qualification is that water can be allocated provided that to do so it is consistent with Objective 1. Given the findings we have made about Objective 1, we must

conclude that allocating water in terms of the balance objectives would not be consistent with the overall scheme of the WCWARP. We have reached this view taking into account the national and local costs and benefits (environmental, social, cultural and economic) of the proposal, as required by Objective 3.

- 14.8 Policy 1 of the WCWARP requires us to take a whole of catchment approach and requires us to recognise the importance of the connectedness between all parts of the catchment from mountains to the sea. In this particular proposal, given the findings we have made in relation to water quality and the connectedness between all parts of the catchment, of rivers draining to the Haldon Arm of Lake Benmore, we have a very real concern that grant of consent could lead to environmental outcomes that would have significant adverse impacts on the water quality beyond the river receiving the immediate drainage from the irrigation site. We conclude then that grant of consent would not be consistent with Policy 1.
- 14.9 Policy 13 links the WCWARP to the PNRRP (as it existed at the time) by requiring us to have regard to how the exercise of the consent could result in water quality objectives in the PNRRP not being achieved. As explained in our Part A decision, we have considered the objectives of the PNRRP and the now operative NRRP in relation to the current proposal.
- 14.10 In the PNRRP (as incorporated into the WCWARP) the Tekapo and Twizel Rivers were classed as 'natural state'. This classification required that there be no change in water quality from their natural state under Objective WQL1.1. In the operative NRRP the Tekapo River has been reclassified as 'Lake-fed' and the Twizel River is classed 'Spring-fed Upland'. The operative NRRP requires that the water quality, for these rivers, be maintained to a certain standard based on their classification.
- 14.11 In the case of the Tekapo River, the change to 'lake fed' allows a more permissive regime with respect to periphyton indicators (200 mg/m³ chlorophyll A and 30% cover of river bed by filamentous algae >20mm). No data has been presented that allow us to assess whether this outcome is currently being achieved downstream of the applicants property, and hence whether it would achieve it after irrigation.
- 14.12 For the Twizel the specified periphyton indicators are 50 mg/m³ maximum chlorophyll maximum chlorophyll a, and maximum 10% cover by filamentous algae > 20 mm. The evidence is this is not currently being achieved and in our view is less likely to be achieved after irrigation of the applicant's property. This is inconsistent with Objective WQL1.1.
- 14.13 Overall then, having regard to the scheme of the WCWARP and the NRRP we reach a conclusion that granting consent in this case would not be consistent with the key objectives and policies of those plans relating to water quality.

Tangata Whenua

- 14.14 Objective 1(a) of the WCWARP relates to the integrity of mauri and is closely linked to Objective 1(b). If we are not satisfied that the health of a particular water body is being safeguarded then the mauri is not being safeguarded either. As noted above, we do not have confidence that even with the mitigation measures proposed by the applicant, sustainable water quality outcomes will be achieved for the Tekapo and Twizel Rivers. It therefore follows that granting the consents may not maintain the integrity of the mauri and also, will not meet the spiritual and cultural needs of the tangata whenua.

Environmental flow and level regimes

- 14.15 Policies 3 and 4 of the WCWARP refer to the setting of environmental flow and level regimes to achieve the objectives of the WCWARP. This is reflected in the rules of the PNRRP which specifies minimum flows and levels for water bodies and allocation limits for specific activities. In relation to this application, the applicant proposes to comply with flow and level regimes in the WCWARP, which should ensure that the proposal is consistent with Policies 3 and 4.

Efficient use of water

- 14.16 Objective (4) of the WCWARP seeks to promote "*the achievement of a high level of technical efficiency in the use of allocated water*". The technical efficiency of the application is consistent with the provisions of the WCWARP. Application by spray within the constraints of an annual volume will require a high degree of efficiency to ensure that crops and pasture are not stressed in extreme conditions and water is not wasted.

14.17 Policies 15 – 20 deal with efficient and effective use of water and are applicable to this application. The Policies provide for an efficient use of water so that net benefits are derived from its use and are maximised and waste minimised. We are satisfied that the rates and annual volumes sought by the applicant reflect an efficient and effective use of water and that the reasonable use test can be met. The proposal is compliant with Policy 16(c)(ii) which the applicants used to calculate the annual volume. Overall, we consider that the proposed irrigation will comply with the reasonable use and efficiency provisions of the WCWARP.

Landscape values

14.18 We discuss the relevant objectives and policies for landscape in our Part A decision. In summary, these are primarily found in the Proposed and Operative CRPS. In broad terms, these provisions seek the protection of outstanding natural landscapes from inappropriate use and development.

14.19 We have earlier set out in detail our considerations in relation to the Mackenzie District Plan and simply record here that we think a grant of consent to the amended application including the mitigation measures proposed and supported by Mr Glasson would be consistent with the relevant objectives of the Mackenzie District Plan in terms of landscape issues. Similarly, we are of the view that the provisions of the CRPS and PCRPS relating to landscape would be supported by a grant of consent.

14.20 For the reasons already advanced, we think that this proposal as amended the applicant during the course of the hearing results in an outcome that landscape effects of this proposal are acceptable and they are capable of being addressed by conditions that could with appropriate mitigation measures the landscape effects of this proposal are capable of being addressed by conditions and could achieve consistency with the relevant objectives and policies. However, given the finding we make on water quality which ultimately determines the outcome for these applications, we do not think it is necessary for us to advance this matter further.

Key conclusions on planning instruments

14.21 For all of the above reasons, we consider that granting the consent would be contrary to the objectives and policies of the WCWARP (incorporating the PNRRP) and the NRRP relating to water quality. As consequence of this is that the proposal would also be contrary to the objectives and policies relating to tangata whenua values.

14.22 For reasons already advanced, we think that from a landscape and amenity effects standpoint granting consent to the proposal as amended by the applicant during the course of this hearing would achieve consistency with the relevant objectives and policies in the Mackenzie District Plan and the proposed and operative CRPS.

15 EVALAUTION OF OTHER RELEVANT S104 MATTERS

15.1 Under s104(1)(c) RMA, we are required to have regard to any other matter that we consider to be relevant and reasonably necessary to determine the application. After hearing all the relevant evidence, we consider that no such matters exist in relation to this application.

16 PART 2 RMA

16.1 Section 104(1) states that the matters which we have discussed above are subject to Part 2, which covers section 5 through section 8 inclusive. We record that our approach is that sections 6, 7 and 8 RMA contribute to and will inform our evaluation under section 5 RMA.

Section 6 – Matters of National Importance

16.2 Sections 6 identifies matters of national importance that we must “recognise and provide for” when making our decision, including preserving the natural character of lakes and rivers (s6(a)), protecting outstanding natural features and landscapes (s6(b)) and the relationship of Maori with the environment (s6(e)).

16.3 In relation to s6(a), we have determined that granting this consent is likely to result in nuisance growths of periphyton in the Twizel, Tekapo, and lower Ohau Rivers that exceed MfE periphyton guidelines, and this would result in a decline in aquatic habitat. Such growths are likely to impact upon the threatened longjaw galaxiids and possibly other native fish. Accordingly, we do not think that a grant of consent would recognise and provide for those matters of national importance.

- 16.4 In terms of s6(e), the application fails to address the spiritual and cultural relationships that Ngai Tahu seeks to maintain or improve in respect of the waterways and ecosystems that are currently sustained in the Ohau, Twizel and Tekapo Rivers and the downstream receiving waters of the Holden Arm of Lake Benmore. In addition, the proposed activity has the potential to have a detrimental effect on the mahinga kai aspirations of Ngai Tahu and the impact of their particular relationship and responsibility to their waters site and taonga..
- 16.5 For the above reasons, we consider that granting consent to the proposal would not recognise and provide for sections 6(a) and 6(e), as we are required to do under the RMA.

Section 7 – Other Matters

- 16.6 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.
- 16.7 Section 7 lists other matters that we shall “have particular regard to”. Sub-sections (a), (aa), (b), (c), (d), (f) and (h) are relevant to this application.
- 16.8 Sub-section (a) and (aa) relate to kaitiakitanga and the ethic of stewardship respectively. The relevant cultural material provided to us through the Ngai Tahu submission (2007), the CIA (including appendices) and the Ngai Tahu evidence at the hearing including reference to on site consultations, represents the active expression of kaitiakitanga. Mr Mikaere endeavoured to assist the applicants give tangible respect to the concerns of Ngai Tahu through the development of on farm mitigation measures including FEMP’s and best management practices. We do not consider that the essence of Kaitiakitanga or good stewardship will be met by allowing irrigation in this location, because of the proximity of rivers and wetlands and the species that rely on them for ecosystem health. The measures outlined in the FEMP demonstrate the intention to provide good stewardship, but in our view they are not sufficiently specific to give us the confidence that the principles of good stewardship will be achieved.
- 16.9 In terms of section 7(b), we do agree that this application would give rise to an efficient use of water. However, in terms of section 7(c), we do not see that a grant of consent for the reasons already advanced would result in the maintenance and enhancement of amenity values, particularly of the Tekapo, Twizel and lower Ohau Rivers. Similarly, Ssection 7(d) refers to intrinsic values of ecosystems, which, as outlined above will be compromised in our view.
- 16.10 Sub-section (f) refers to maintenance and enhancement of the quality of the environment. Our view is that this will not be achieved in streams adjacent to the proposed irrigation area. We also observe that the Tekapo and Ohau Rivers are recognised as sites of natural significance within the Mackenzie District Plan.
- 16.11 Sub-section (h) refers to protection of habitat of trout and salmon. In our view trout could be negatively impacted through the degradation of their habitat by nuisance periphyton growths, which in turn would reduce the production of species upon which trout preferentially feed (mayflies).
- 16.12 Having particular regard to the above matters in the context of section 7, we conclude that the grant of consent could not be supported

Section 8 – Treaty of Waitangi

- 16.13 Finally, section 8 of the RMA has had a cascading influence on the development of regional and district plans in so far as they affect the Upper Waitaki through the integration of Ngāi Tahu values into the respective objectives and policies. The applicant contributed to the development of a Cultural Impact Assessment (CIA) and the engagement of a cultural expert to assist applicants address the issues identified in the CIA. The applicant has endeavoured to address cultural issues through the adoption of mitigation measures developed by MWRL. However as discussed in Part A of our decision we find that the proposed mitigation measures will not avoid, remedy or mitigate adverse effects on the receiving waters and therefore the associated Ngai Tahu interest.

Section 5 – Purpose of the RMA

- 16.13 Turning now to the overall purpose of the RMA, that is, “to promote the sustainable management of natural and physical resources”.

16.14 The proposal as a whole, would allow the development of land to occur, which may provide for the economic and social well-being of the community. However are not convinced that the application, if granted, will safeguard the life-supporting capacity of water ecosystems (Section 5(2)(b)_ , and in our view the applicant has not proposed a full set of mitigation measures to "avoid, remedy or mitigate" the potential impacts of irrigation on water quality as required in Section 5(2)(c).

17 OVERALL EVALUATION

- 17.1 Under s104B of the RMA, we have a discretion as to whether or not to grant consent. This requires an overall judgment to achieve the purpose of the Act and is arrived at by:
- (a) Taking into account all the relevant matters identified under s 104;
 - (b) Avoiding consideration of any irrelevant matters;
 - (c) Giving different weight to the matters identified under s 104 — depending on our opinion as to how they are affected by the application of s 5(2)(a), (b), and (c) and ss 6-8 — to the particular facts of the case; and then in light of the above; and
 - (d) Allowing for comparison of conflicting considerations, the scale or degree of conflict, and their relative significance or proportion in the final outcome.
- 17.2 We find that there will be adverse effects of the activity on the environment, in particular to growths of periphyton in the lower Ohau, Twizel, and Tekapo Rivers. We have also found that granting consent would be contrary to policies and objectives in the WCWARP and the NRRP as we have earlier identified. We are also mindful that the grant of consent will not, in our view, meet the purpose of the RMA as that purpose is embodied in section 5.
- 17.3 We recognise that irrigation of the subject site will provide economic benefits at both a local and national scale. The economic benefits would arise in the Mackenzie District for the applicant, primarily, and others who would benefit economically from the increase in production from the subject site. However, in our view, we should give that matter less weight than the effects on water quality that concern us, as we see that water quality effects far outweighs in terms of scale and degree and is much more significant for us in the final outcome.
- 17.4 Having reviewed the application documents, all the submissions, taking into account the evidence to the hearing and taking into account all relevant provisions of the RMA and other relevant statutory instruments we have concluded that the outcome which best achieves the purpose of the Act is to decline consent.

18 DECISIONS AND REASONS

- 18.1 Pursuant to the powers delegated to us by the Canterbury Regional Council:
- 18.2 For all of the above reasons and pursuant to sections 104 and 104B of the Resource Management Act 1991, we **DECLINE** application CRC072118 by Rosehip Orchards NZ Limited.

DECISION DATED AT CHRISTCHURCH THIS 22ND DAY OF NOVEMBER 2011

Signed by:

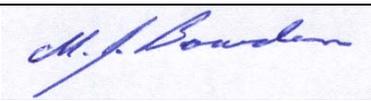
Paul Rogers



Dr James Cooke



Michael Bowden



Edward Ellison

