

**IN THE MATTER OF THE**

Resource Management Act 1991

**AND**

**IN THE MATTER OF AN**

Application by **H G Campbell**  
(CRC071927) to take and use  
groundwater from the Chertsey  
Groundwater Allocation Zone.

**DECISION OF THE HEARING COMMISSIONERS**

Heard on 30 October 2008 at the offices of the Canterbury Regional Council,  
Kilmore Street, Christchurch.

**INDEPENDENT HEARING COMMISSIONERS**

Messrs Alan Withy (Chair) and Tom Heller.

**APPEARANCES**

**The Applicant (HG Campbell)**

Ms Rachel Dunningham, Buddle Finlay (Counsel)

Mr Neal Borrie, Aqualinc (Environmental Engineer)

Mr John Campbell (Farmer)

**Council Officers**

Mr David Just (Investigating Officer)

Mr Mike Thorley (Groundwater Hydrologist)

**Date of decision: 30 March 2009**

## DECISION

On behalf of the Canterbury Regional Council, pursuant to section 127, Resource Management Act 1991, we have determined as follows:

1. That Resource consent **application CRC071927** by HG Campbell to take and use groundwater in the Chertsey Groundwater Allocation Zone **is granted** subject to conditions.
2. The duration of the consent is for ten years from the date of this consent.
3. See Annexure 1 for the Conditions numbered 1-13.

### Glossary of Terms and Abbreviations:

Act:	means the Resource Management Act 1991 unless specified otherwise.
AEE:	means an Assessment of Environmental Effects.
Council:	means the Canterbury Regional Council.
CRC:	means the Canterbury Regional Council.
ECan:	means the Canterbury Regional Council.
GAZ:	means a Groundwater Allocation Zone.
IO:	means the Investigating Officer in terms of Section 42A of the Act.
NZMS:	means the New Zealand Map Series.
PNRRP:	means the Proposed Natural Resources Regional Plan.
RMA:	means the Resource Management Act 1991.
RO:	means the Reporting Officer in terms of Section 42A of the Act.
RoR:	means the formal right of reply exercised by Counsel for the Applicant.
RPS:	means the Canterbury Regional Planning Statement.
TRP:	means the Transitional Regional Plan.

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## **INTRODUCTION**

This is the decision of Independent Commissioners Alan Withy (chair) and Tom Heller appointed by the Canterbury Regional Council (“CRC”) to hear the application by HG Campbell which was granted on 30 March 2009. Authority was delegated by CRC Letter dated 17 October 2008 from Mr Donald Fraser, Consents Officer.

### **1. The Application**

This application to take and use groundwater was publicly notified in the Ashburton Guardian on Saturday 12 May 2007.

It relates to an existing bore L37/0626 (diameter of 300 millimetres and depth of 149 metres) at or about Map Reference NZMS 260 L37:3086 – 0698.

The application seeks consent for a maximum rate of take of 47 litres per second with a volume not exceeding 3,892 cubic metres per day, and not exceeding 447,150 cubic metres between 1 July and the following 30 June in any year.

Water will be used for the spray irrigation of 110 hectares of crops and pasture at the corner of Gardiners Road and Kyle Road, Pendarves.

The application is for a new ‘take’, and a duration of ten years is sought for the activity.

### **2. Submissions**

Three submissions were received within the statutory timeframe. Two were in support of the application, and one neither supported nor opposed the application.

The two submissions in support of the application noted the application relates to the only bore on the applicant’s property. Neither wished to be heard, and neither considered themselves potentially adversely affected.

The Water Services Manager of the Ashburton District Council filed a submission neither in support nor opposition. It noted his Council was potentially affected as the owner and manager of the Chertsey Community Water Supply, which is located approximately 5 kilometres from the applicant’s bore. It indicated support for granting the application, provided there will be no adverse effects on the Chertsey Community Water Supply. The submitter requested to be heard at the hearing, but subsequently withdrew the right to be heard.

### **3. Statutory provisions**

This application is subject to the provisions of both the Proposed Natural Resources Regional Plan (PNRRP) as well as the Transitional Regional Plan (TRP).

The IO advised (and the applicant did not challenge) that:

- a. The proposed water 'take' is a discretionary activity under the TRP as the proposal exceeds the requirements for general authorisation.
- b. Rule WQN22 of the PNRRP deems this proposed water 'take' to be a non-complying activity.
- c. The proposed water 'use' is a discretionary activity under the TRP.
- d. Rule WQN25 of the PNRRP deems the 'use' permitted.
- e. **Overall** the proposed activity is considered to be **non-complying**, because that status under the PNRRP is more restrictive than the discretionary status under the TRP. However, the proposed use is considered to be discretionary, commensurate with the more restrictive provision in the TRP.

#### 4. Appearances and evidence

**Ms Rachel Dunningham** presented the application for the HG Campbell Estate and described it as a 'true exception'. She explained it was part of a group of twenty applications to be heard in 2009 and CRC Officers had accepted it should be given an earlier hearing on "urgency" grounds.

She explained that the Campbell family have relied upon consents to drill bore L37/0626 and to take groundwater, granted in 1994 and in 1995 respectively. She said they indicated an expiry date in 2030 and contained no reference to a lapse date. Furthermore she asserted that the CRC expressly advised that the application for water take was still current as recently as late 2006, when in fact it had lapsed.

Ms Dunningham pointed out that the Applicant's expert evidence and that of the CRC IO align in every respect except whether the "*potential adverse cumulative effects on other groundwater users would be more than minor*". She argued that in the absence of submitters in opposition, and given discretion to grant the application in terms of the relevant plans, the application should be granted.

She referred us to case law, in support of the following propositions:

- a) The RMA operates on a "first come, first served" principle.
- b) This application has priority over others not ready for notification.
- c) This application should be considered without reference to any higher priority applications.

She argued that despite this groundwater zone being 'fully allocated', this application is a "true exception" and comprises less than 0.4% of the total ground water allocation available in the zone. She drew attention to policy WQN14(9)(d)(iii) which provides for a water 'take' in excess of an allocation limit, where it can be demonstrated that "*the proposal will not compromise the environmental values sustained by groundwater levels, nor compromise the reliability of supply of existing users*".

She also pointed out that the applicant has in good faith invested approximately \$180,000 in irrigation development, which would be wasted without consent to take water. She concluded that *“there is no compelling evidence that the grant of consent will have more than minor adverse effects on the environment, and there are good reasons for granting the consent ...”*.

**Mr John Campbell** gave evidence about the history of the property owned by his father, Mr HG Campbell, the applicant. He described enquiries he had made of the Regional Council and why his family had assumed the consents granted in the mid-1990s were still current. He also described interim arrangements for obtaining irrigation water in the previous season and during the coming summer.

**Mr Neal Borrie** a Senior Environmental Engineer of Aqualinc Research Ltd, holding qualifications in agricultural and civil engineering, gave evidence in support of the application. His evidence covered the following matters:

- a) Background to the application.
- b) The application and submissions.
- c) Irrigation currently occurring on the property.
- d) Description of the groundwater environment.
- e) Assessment of the potential environmental effects.
- f) Comments on the CRC IO Report.

He described the irrigation of the property under a short-term consent which will expire at the end of May 2009. He described the Chertsey Groundwater Zone in detail, and described the potential effects of the proposal on the zone and neighbouring bores. He then considered cumulative effects of the proposal and commented on the Council IO Report.

He highlighted the main issue upon which he did not agree with the Report, and said the IO had offered no substantive reason as to *“why the granting of this consent will affect the reliability of supply of existing users of groundwater given the modest size of the proposed take of less than 0.4% of the interim allocation limit of the Chertsey Groundwater Zone”*. He supported granting of consent subject to the conditions recommended by the IO, with one exception: *“condition 11(c) is not required as it is included in condition 8”*.

**Mr David Just**, Investigating Officer for CRC described in his pre-circulated report:

- a) Background to the application.
- b) Lapse dates, notification and submissions.
- c) The proposal.
- d) Legal and planning matters.
- e) The environment.
- f) Actual and potential effects.
- g) RPS and PNRRP policies and objectives.
- h) RMA matters.
- i) Recommended conditions.

In his report, he identified “Branfield Farms” with three existing bores as the only property likely to be significantly affected by the proposal in terms of priority issues over cumulative drawdown, and pointed out that in 2006 the application would have been treated as a discretionary activity rather than non-complying as is now the case. He expressed concern for the 22 applicants “in the queue”, but did concede that this property had been “somewhat mishandled” and that this was a valid consideration in this case.

He concluded that he could not recommend consent being granted “*without the effects discussed above being determined and confirmed to be minor*”. He nevertheless recommended a ten year period and 13 possible conditions.

He elaborated on his written report at the hearing and answered questions from the commissioners.

**Mr Mike Thorley**, a groundwater hydrologist employed by CRC gave evidence regarding:

- a) The hydrogeology of the Chertsey Groundwater Allocation Zone.
- b) Background to the PNRRP policy on groundwater allocation.
- c) Policies and methods contained in the PNRRP.
- d) Measured groundwater levels in the zone.
- e) Potential cumulative effects on groundwater levels.

He indicated that actual water use in the zone is not fully monitored and anecdotal evidence suggests that the existing allocations are not fully utilised. He described the relevant PNRRP policies as “conservative”, but advised a precautionary approach to groundwater allocation.

He elaborated on his written report at the hearing and answered questions from the commissioners.

**Right of Reply** – Ms Dunningham drew comparisons between the Thorley and Borrie evidence, urging the commissioners to rely more upon that of Mr Borrie. She contended that Mr Thorley’s graphs were misleading and therefore his conclusions less reliable than Mr Borrie’s.

She emphasised the minimal effects that granting consent would have on the environment and urged the commissioners to regard the proposal as a true exception and worthy of approval.

## 5. General

It was apparent that there was general agreement between CRC officers and the applicant’s consultant Mr Borrie on the likely effects of the application. Messrs Just and Thorley took a more conservative approach and were not convinced that the proposal met the requirements of Section 104 of the Act. Mr Borrie on the other hand, considered the proposal would have minimal effects on the groundwater zone and nearby properties, and believed the proposal meets the tests of Section 104.

Our preliminary appraisal of the submissions and evidence led us to conclude that the modelling results and conclusions provided by the applicant's advisers on the one hand and the investigating officers on the other, were significantly different. We therefore adjourned the hearing and sought further information.

## **6. Further information**

Following adjournment of the hearing, further information was requested from the CRC Officers and the applicant pursuant to Section 41(4) of the RMA. The information requested covered the following points:

- i. Provision of an additional draft condition to address possible concurrent use of groundwater for the requested consent, with other sources of water, on the same land parcel area specified for irrigation in the application.
- ii. A WQN10 assessment of current applications to take groundwater in the Chertsey GAZ, which are ahead in the queue and within 2 km, of this application.
- iii. In connection with the Aqualinc modelling results given in evidence, provision of expanded time-series graphs of simulated and measured groundwater levels for specific monitoring wells/sites.

The additional information was received in December 2008 and referred to each party for comments. They were then received by us in late January and the hearing was formally closed and the parties notified.

## **7. Evaluation of effects**

### **Any actual or potential effects on the environment**

Following the template provided for in Section 104 we will now consider the actual or potential effects on the environment of allowing the activity. We have broken down those effects in to the following sub-sets:

- Groundwater allocation zone setting
- Cumulative effect of takes on other groundwater users
- Adverse effect of the take on groundwater allocation
- Adverse effect of the take from sea water intrusion
- Adverse effects of takes on aquifer stability
- Adverse effect from cross-connection on groundwater quality
- Adverse effect of the take on surface water flow
- Adverse effects of well interference/take on surrounding groundwater users
- Adverse effect of inefficient take on other groundwater users
- Adverse effects of use of water on water quality

- Adverse effects of the take on Tangata Whenua values.

We will now move to apply these subsets of effects to the application before us.

### **Groundwater allocation zone setting**

The application subject to this hearing is located within the Chertsey GAZ. The Chertsey GAZ is located between the Rakaia River (to the North), and a water table divide depicted by Chertsey – Kyle Road, Jamisons Road, Line Road, Waimarama Road and McLennans Bush Road to the south. The coastal boundary of the zone is the Pacific Ocean, with the inland boundary being the base of the Canterbury Foothills.

The Chertsey GAZ is described as being typical of the Canterbury Plains, consisting of a series of coalescing Quaternary gravel fans derived from erosion of the Southern Alps. The zone is predominantly made up of the Rakaia fan, which consists of glacial outwash, and interglacial and post-glacial alluvium. Groundwater within the Chertsey GAZ is located within the alluvial sediments that make up the aquifer system.

There are very few natural surface water features within the Chertsey GAZ. However, the most notable feature within the zone is the Rangitata Diversion Race, which bisects the upper area of the zone. Groundwater is recharged from rainfall, river flow, stock water and other water supply race losses and drainage from irrigation water applied to the land. The age of groundwater within the Chertsey GAZ is typically younger than that of the Christchurch Artesian Aquifer System, indicating faster through-flow.

Mr Thorley had broadly summarised the occurrence of groundwater within the Chertsey GAZ as being:

- To the east of State Highway One, two semi-confined aquifer zones consistently occur, the first between 60 and 85 metres below ground, and the second between 130 and 160 metres, separated by layers of claybound gravels
- More recent exploration inland has identified deeper aquifer layers screened at various depths between 90 and 249 metres, yielding between 9 and 53 litres per second, with fewer at greater depths possibly as a result of the expense of drilling. Where available, geological logs for existing wells indicate a sequence of variably sorted gravels, with aquifers occurring where there is a lower proportion of clays and silts
- Adjacent to the Rakaia River there is a narrow band of shallow wells within the terraces of the Burnham Formation.

Mr Borrie had described the groundwater environment surrounding well L37/0626 (within 5 kilometres) as:

- The groundwater is flowing in a SSE direction, with a gradient of 0.0026 (i.e. 2.6 metres per kilometre)
- There is a preferred water bearing zone in the shallower aquifer between 40-60 metres below ground level, with water levels down to 67metres
- The preferred water bearing zone in the deeper aquifer appears to be less than 105 metres below ground level

- Groundwater level measurements of the bores at the depth range of 90-110 metres appear to be lower than that of immediate shallower bores. This indicates that bores shallower than 90 metres abstract water from different aquifers than that of the deeper bores.

We feel that the aquifer descriptions provided by both the applicant and the reporting officers were of a factual nature, considering all available information for the Chertsey GAZ. However, Mr Borrie's comment that based upon a differential of water table and potentiometric surface levels, that shallow wells may abstract from a "different" aquifer appeared to be the only inconsistency with Mr Thorley's information. The detail surrounding the degree of confinement or separation of various water bearing layers was not provided in evidence at the hearing, and we did not consider any further information in that respect on the basis of the assessment of cumulative groundwater allocation upon groundwater users. We discuss this matter in further detail below.

Although, both the applicant and the reporting officers agree that for short to medium term WQN10 well interference assessments, the distinction between water bearing layers (and lower permeability layers) was acceptable.

#### **Cumulative effect of takes on other groundwater users**

It was clear that the key determination for us which emerged during the course of the hearing and in consideration of all of the materials provided was whether or not there were any adverse effects of the proposed take upon cumulative groundwater allocation in respect of other groundwater users and the receiving environment.

However, this determination was also in consideration of the "exception" associated with this application, as it was also clear to us that through no fault of any party, the applicant was potentially disadvantaged in terms of the timing of this application and the subsequent priority for allocation of the (groundwater) resource. We elaborate further (as below) in respect of this matter.

We now turn to matters of the cumulative effect of existing takes in relation to the proposed activity, which is an application to take "new" water in a fully allocated Groundwater Allocation Zone. The Chertsey GAZ is determined to be more than 100% allocated to existing consent holders.

The cumulative effects of groundwater takes specific to the Chertsey GAZ are in terms of the control of the amount of water allocated so that there is not a significant continuing long-term decline in mean annual groundwater levels and artesian pressures. Information from the applicant and reporting officers has been provided to us in evidence at the hearing and in our further information request, as to the status and trend of groundwater levels in the Chertsey GAZ. This information has been presented in terms of time-series hydrographs and the results of modelling of existing takes.

Mr Thorley (in evidence) identified from groundwater level time-series hydrographs, that there was strong evidence of major declines in groundwater levels in the Chertsey GAZ. This has been due to rapid development of groundwater. However, existing users of the resource had not experienced any problems with reliability of supply.

Mr Borrie, whilst largely concurring with the S42a reports, suggested that in consideration of regional groundwater allocation and hence, regional groundwater levels, that some groundwater level indicator sites had relatively short terms of record. Hence, when considering short term variability in climate, it was difficult to draw any conclusions upon level trends, particularly when measured winter groundwater levels may be affected by below average rainfall recharge over several seasons.

Our examination of the groundwater level hydrographs provided by Mr Thorley leads us to the following positions on aquifer trend:

- Whilst we agree with Mr Thorley that a straight line fit to the hydrographs produces a declining trend in all cases, there are effects of seasonality of use, climate and possible surface water interaction (boundary conditions) which have not been allowed for in all of the analyses.
- We recognise that only one hydrograph presented contains a data record length in excess of ten years. However, Well L37/0024 (of moderate depth 61 – 70 metres) record does reflect the recent declining trends (since about 1997), but also exhibits a relatively static period from 1980 to 1997 (17 years).
- There appears to be discrete hold points within most time series, indicating that trend analyses would be better served by some other form of model rather than a linear interpolation. However, we accept that Mr Thorley has presented the hydrographs for illustration purposes to add context to the existing groundwater allocation regime and had not relied upon any statistical significance test in respect of confirming trends in the data.

Based upon the time series information it is clear to us that a recent declining trend is evident, albeit by linear interpolation and or visual assessment. However, based upon the one longer-term time series, it is difficult to ascertain the long term trend. Although, we do note the recent increase in the magnitude of seasonality in the data, which as referred to earlier, may be borne out of climate variability as well as groundwater use.

Mr Thorley also presented some time-series groundwater quality graphs (in evidence). These graphs were for visual reference only and no statistical analysis had been undertaken on them or relied upon in evidence. The scatter of data points in each graph did make them difficult to interpret. However, Mr Thorley accepted this and indicated that we may treat the data as further background information.

An overview of the modelling work completed for the Rakaia-Selwyn resource consents hearing was presented by Mr Borrie in evidence. This modelling work was provided for that hearing to predict the response of the groundwater system to changes in land use and groundwater development. Mr Borrie accepts that this modelling is one of regional scale, and was not undertaken specifically for the Chertsey GAZ, or in relation to the applicant's proposed activity.

However, Mr Borrie considered that as the regional modelling covered the area of the Chertsey GAZ, the regional scale impacts upon groundwater levels from the simulation of abstraction (from all consents granted as at July 2005) would provide a fair representation of the potential for adverse cumulative effects upon existing groundwater users and the aquifer environment.

Time-series graphs of simulated groundwater levels were presented which showed “no abstraction” and “status quo” abstraction scenarios. Mr Borrie concluded that under the status quo abstraction scenario, groundwater levels declined on a seasonal basis in response to abstraction, but fully recovered every year to the level at which no abstraction would have occurred. The overall outcome being that those levels of groundwater abstraction were sustainable and that the groundwater system was not being mined.

Mr Borrie also commented on the recent period of record which showed a downward trend in groundwater levels. He stated that based on the modelling work completed, other factors (such as climate) were responsible for the trend. The evidence for this was in examination of winter groundwater levels which showed little recovery due to below average rainfall recharge that had occurred over several seasons.

It was noted that it is unlikely that further consents to take groundwater in the Chertsey GAZ have been granted in the interim (since 2005). As such, the current level of abstraction in the zone will be similar to that as modelled.

In response to our further information request, Mr Borrie provided plots of the “no abstraction” and “status quo” scenarios with available monitoring data overlaid for each indicator well. He concluded that whilst some predicted groundwater levels were higher than measured, some were lower and others were consistent. This goes to the purpose of the regional model, being primarily an indicator of relative trend and not necessarily exact replication of levels in all cases. Mr Borrie repeated his initial comments on the recent declining trends in groundwater levels being driven by climatic influences rather than unsustainable groundwater abstraction.

Mr Thorley wrote that in his opinion the plots of the simulated and measured groundwater levels provided by Mr Borrie show that the numerical model does not sufficiently replicate predictions of groundwater level response to abstraction. He also indicated that the information and comments provided by the applicant that rely upon the numerical groundwater model should be treated with caution.

At this time we did not seek to obtain any further information on the calibration or verification of the model. We have taken both the time-series plots as provided by Mr Thorley and the time-series plots of model results from Mr Borrie at face value. On the basis of providing certainty in either long-term or more recent groundwater level trends, and for completeness of this decision we make the following observations of the modelling results:

- The time series plots as presented do show historically and in more recent times that if current levels of abstraction had occurred, then a plausible outcome would be for consistency with the non-abstraction scenario post irrigation seasons, within each season.
- The groundwater model reflects climate variability in terms of recharge and thus, the no-abstraction time series data should reflect the recent declining trend, in which it does to some degree
- The model also predicts with some consistency, a reasonable magnitude of seasonal variation, albeit, with relative inconsistency with measured groundwater levels. The inconsistency with measured heads does equate in some cases to approximately over 5 metres.

- The key aspect of the plots as presented is that during the recent period of groundwater decline, the difference between simulated status quo and measured groundwater levels tends to increase. This can be brought about by one of two reasons assuming that all other hydraulic and water balance components of the model are in order. Firstly, that the model under-predicts the true effects of climatic variation and secondly that it under-predicts the inter-seasonal effects of groundwater abstraction, or both.

On the basis of the time-series data provided by Mr Thorley and the modelling data provided by Mr Borrie, we agree that in recent times, there has been a downward trend in groundwater levels in the Chertsey GAZ. The groundwater model indirectly confirms this trend. Although, we are not convinced by either sets of information that each model does truly “explain” such trends. As indicated above, we did not feel it necessary to explore model validation or trend analysis techniques in resumption of this aspect of the decision. This is in relation to our assessment of the exception to groundwater allocation in this instance, as discussed below.

#### **Adverse effect of the take on groundwater allocation**

We now move to address the proposed activity in the context of allocation of groundwater in the Chertsey GAZ.

The PNRRP has established 29 Groundwater Allocation Zones within the Canterbury Region. This application occurs within the “Chertsey” GAZ and Policy WQN14 sets out the allocation regime for this zone. The limit for each allocation block (for each GAZ) is an annual volume, the size of which has been set as a numerical limit in Table WQN29 resulting from the notification of Variation 4 of the plan.

The volume of water currently allocated from the Chertsey GAZ has been determined using the formula set out in Schedule WQN4(c) and comes to 116.80 million cubic metres per annum. Therefore, the effective allocation (as at 6 October 2008) is currently 103.92% of the allocation block set as 112.4 million cubic metres per annum. There are applications ahead of this application in priority for water in the Chertsey GAZ. If this application and all higher priority applications were granted, the effective allocation would increase to 116.20%.

There has been no debate over the calculation of LSR or effective allocation for the Chertsey GAZ and there was no debate over the allocation limit set for the zone.

There was a suggestion during the hearing that further consideration of additional intermittent streams should be made in respect of recharge contribution at the upper part of the zone, and that of possible Rakaia River leakage at reaches below SH1. This was noted by Mr Thorley and he explained that Council was not in a position to validate those potential recharge sources at this time. Needless to say that Council was actively looking into possible additional sources of recharge.

We do note that in Mr Thorley's evidence, he outlines that Alpine river recharge provides a large component of groundwater recharge to the Canterbury Plains. This has been assessed as being of a similar magnitude, or larger than land surface recharge. In the provision of groundwater allocations to selected Canterbury Plains aquifer allocation zones, this recharge is assumed to provide a base-surface, being the level groundwater would naturally fall to if no land surface recharge occurred.

Mr Borrie stated that in the Chertsey GAZ, there are no spring-fed streams that are connected to shallow groundwater. Therefore, unlike some other groundwater zones in Canterbury, there is little reliance upon groundwater to sustain spring fed streams, in relation to groundwater takes that may lower groundwater levels.

The applicant had requested that the application be treated as a replacement to an existing entitlement that up until as late as October 2006 was included in the groundwater allocation for the Chertsey GAZ. The rate, volumes and area to be irrigated (as sought) are the same as those consented under CRC951132 (the previously lapsed consent). Given this application is for the same amount of water as CRC951132, Mr Borrie considered there to be no adverse cumulative effects from the proposed abstraction.

Mr Just stated that the lapsing of a current consent (CRC951132) means that the consent holder is no longer entitled to the water and hence this application was treated as a water permit to take "new water", as the applicant was not able to apply for "replacement consent" under S124 of the RMA.

This application was very different from most in that the Applicant was under the very firm opinion that he held a "right" to take water and that this opinion was reinforced by actions of Officers of the Council. Although the legal position is clearly that the "right" had lapsed, it is equally clear that the Applicant in good faith believed that the "right" continued. Enquiries of Council Officers appear to have reinforced that belief and the Applicant was given no reason to suspect that the "right" might lapse, or had lapsed. We believe that in this instance, the applicant had performed all that might reasonably be expected in terms of securing the "right" and in confirmation of such matters with the Consent Authority.

If at the time of initial enquiry, the Applicant had come to the conclusion that the "right" was in jeopardy, there were reasonably straightforward options available to secure that "right". However, due to "favourable" communication with the Consent Authority, the applicant had not sought to make any application for water at that time.

Overall, we conclude that this is a relevant consideration in determining this application with respect to groundwater allocation. We also noted that Mr Just (at the hearing) indicated when questioned on this matter, that he did not disagree with these circumstances surrounding the application.

Although, Mr Just identified that the applicant had not obtained written approvals from those 'ahead' in the queue of applications for water from this zone. Obtaining written approvals from these parties would have meant that all parties approved of this application to be considered ahead of their applications.

Apart from effects upon cumulative groundwater allocation, applications with a higher priority within 4 kilometres of this application were considered in assessment of on-site effects.

Mr Just indicated that consideration should be given to Mr Thorley's report, as it provides evidence of a decline in groundwater levels in the Chertsey GAZ, along with evidence of rapid groundwater development which indicates that the effects of the current allocation may not yet be apparent in groundwater level records. His conclusion was "I do not consider that there is sufficient water available within the Chertsey Groundwater Allocation Zone to grant this application".

Mr Just also indicated that should we be of a view to granting this application, the most current measuring and monitoring conditions should be included as conditions of consent to ensure that the volume of water is accurately recorded. In addition to those conditions, he recommended a condition requiring the applicant to undertake regular measurements of the standing water level in the well. He explained that this will assist in determining if the abstraction in combination with existing consents is not contributing to a long-term decline in groundwater levels.

Mr Borrie suggested that under the interim allocation block the Chertsey GAZ is fully allocated, but the PNRRP policy WQN14(9)(d)(iii) provided for the taking of water in excess of an interim allocation block provided that it would not compromise the environmental values sustained by groundwater levels and will not compromise the reliability of supply of existing users provided for in Policy WQN14(7)(a) and WQN14(7)(b). Mr Borrie in evidence confirmed that the proposed take would not compromise the aforementioned values and therefore consent may be granted.

After considering all of the information provided, we agree with the reporting officer's position of caution when considering further allocation in the Chertsey GAZ. However, in respect of the exception to this, the applicant does have a legitimate claim of being disadvantaged over this matter. Thus, in recognition of the existing allocation of water and the evidence from either party as to the status and trend in groundwater levels, and by applying the exception principle as clearly exists in this case, we do not accept that the applicant's proposition will be adverse upon groundwater allocation.

However, whilst we agree with the applicant in terms of exception on the allocation issue, we also assessed if any other well or application for groundwater take may be adversely affected by the current proposal, which we cover in the following sub-sections of this decision.

**Adverse effect of the take from seawater intrusion**

Effects of coastal seawater intrusion can occur if potentiometric levels in an aquifer sufficiently fall adjacent to the coastal interface to reverse the hydraulic gradient and allow inland movement of salt water. Also, specific well abstraction may have a direct effect on groundwater levels near the coast and may induce localised intrusion or up-coning of the saltwater interface.

The CRC saltwater intrusion guidelines specifically relate to activities of well drilling and groundwater abstraction within 2,000 metres of the coast line. The location of the proposed abstraction before us is in excess of 2,000 metres from the coast and has thus not been considered as increasing any risk of saltwater intrusion.

The potential effects of cumulative allocation in regard to seawater intrusion have been broadly covered in the above sub-sections of this decision. This is in relation to groundwater level trends and potential adverse effects upon cumulative allocation in the Chertsey GAZ.

**Adverse effect of takes on aquifer stability**

There was no suggestion from any party that aquifer stability would be compromised by the proposed take and we concur with that position.

**Adverse effect from cross connection on groundwater quality**

We have been advised that the well considered in this application (L37/0626) is to be screened in one aquifer only. The screen depth is stated as being greater than 140 metres below ground level. We agree with both the applicant and the reporting officers, that given the above details, the proposed abstraction is unlikely to result in any adverse effects from cross-connection upon groundwater quality.

We also accept, that to avoid potential contamination of the aquifer from accidental spills, fertiliser use or metals exposure, that suitable backflow prevention be installed at the well.

**Adverse effect of the take on surface water flows**

The only concern for the application before us with respect to adverse effects on surface water flows was the case where taking hydraulically linked groundwater may deplete adjacent surface waters. This depends on the depth of the groundwater take, the size of the take, the distance to the connected surface water body and the degree of connection from the stream bed and hydraulic conductivity of the aquifer material present.

Mr Borrie had stated in evidence that the subject well is installed to 149 metres below ground level and that the nearest surface water-feature (the Rakaia River) was at least 8 km from the site. He suggested that any stream depletion effect of the proposed take would be negligible.

Based on the well depth and location details, we are satisfied that the proposed take from deep well L37/0626 would have a less than minor effect upon surface waters considering the semi-confined nature of the target aquifer (as reflected in hydraulic calculations) and the distance to the nearest surface water feature.

**Adverse effects of well interference/take on surrounding groundwater users**

The level of acceptable well interference outlined in the PNRRP from a nearby pumping well, is defined in Policy WQN20 as being consistent with a level in the subject well which is “protected available drawdown” as determined in Schedule WQN10. This is specifically “the protected available drawdown shall be determined as 80% of the drawdown available at a groundwater level that is exceeded 80% of the time during the period of proposed water use, having taken into account individual well and pump installation details”. This may be done by reference to spot levels in other nearby wells and related back to the longer term record in the nearest CRC monitoring bore. Having done this, the available drawdown in the subject well is calculated and 80 % of this drawdown is protected i.e. interference is unacceptable if 80% of the drawdown calculated is not available for 80 % of the time. The levels of interference applied also take into account the direct cumulative affects of all abstraction on the subject well, provided it adequately penetrates the aquifer to allow effective access to the resource.

A *de minimis* threshold of 0.05 metres is set for direct drawdown effects, below which effects are considered to be insignificant.

Mr Borrie had used a Hunt-Scott ‘leaky’ assessment methodology to identify potentially adversely affected groundwater users. Data from an aquifer test performed on L37/0626 provided the parameters used in the assessment. They were for:

- Transmissivity of 2,620 square metres per day
- Storativity of 0.0001, and
- $K'/B'$  (leakage) of  $1 \times 10^{-9}$  metres.

Mr Borrie’s assessment considered bores shallower than 80 metres below ground level to be within an overlying water bearing layer. His assessment uses a seven day pumping rate (Q7) of 45 litres per second and a 150 day pumping rate (Q150) of 27 litres per second.

Mr Borrie had also cited the report by Davey (2006) and concluded that based upon the distribution of aquifers and semi-confining layers within the Chertsey GAZ at about the applicant’s well, that to be conservative, wells between 80 to 180 metres depth have been included in the assessment of environmental effects on neighbouring wells. Mr Borrie has explained in evidence that bores shallower than 100 metres in depth will have only a minor connection to well L37/0626.

Mr Borrie explained that a selection of wells were analysed within 5 kilometres of L37/0626 and that he found groundwater to be flowing in a SSE direction with a gradient of 0.0026. The lowest levels of wells have been assessed with the use of neighbouring well levels and by integrating the above gradient for the area.

The results of the assessment indicated that the cumulative drawdown's (including the direct drawdown from pumped well L37/0626) were within the acceptable limits as set out in Policy WQN20; for all wells at depths of between 80 and 180 metres, within a two kilometre radius. Hence, the effects of the proposed take from well L37/0626 were assessed as minor upon surrounding groundwater users.

In audit of Mr Borrie's well interference assessment, CRC staff recommended using a more conservative Transmissivity of 2,300 square metres per day and the application of the 'Theis' assessment to all wells of a depth greater than 75 metres below ground level. The resulting CRC audit of Mr Borrie's well interference assessment indicated that no wells would be potentially adversely affected. At this time however, it was suggested in evidence of Mr Just, that there may be a potentially affected application for groundwater take (CRC041357 Branfield Farms Limited), ahead in the queue of this application.

We requested in further information, that a WQN10 assessment be undertaken to assess if any applications to take groundwater from the Chertsey GAZ that were ahead in the queue of this application would be potentially adversely affected (for their individual WQN10 analyses) by the cumulative drawdown resulting from this additional take. This analysis was based on consent application notifiable dates and was undertaken for all wells of sufficient depth within a 2 kilometre radius of this application. The assessment also considers another 2 kilometre radius of each identified well within the initial 2 kilometre radius.

In reply, Mr Just advised us that application CRC041357 Branfield Farms Limited had been withdrawn and no longer required consideration of priority. No additional applications within the area of analysis were found to be ahead in the priority queue of this application. The resulting outcome of the analysis was that no nearby wells would be adversely affected by this application (CRC071927) being granted ahead of priority.

There were essentially no differences in approach between the applicant and the investigating officer in estimating well interference effects. However, there were some small discrepancies in the parameters used in the drawdown interference assessments.

We are satisfied that on the basis of the initial WQN10 assessment and as provided in additional information sought by us, that potential interference effects from deep well L37/0626, upon any existing or higher priority well/take, will be of a minor nature.

**Adverse effect of inefficient take on other groundwater users**

Efficiency of take has been assessed for the application before us. The abstraction has been reviewed for annual volumes calculated based on the methods prescribed in Schedule WQN9 of the PNRRP.

The maximum daily water application rate of 3.5 millimetres (3,892 cubic metres) and the seasonal volume of 447,150 cubic metres is acceptable to the applicant and was accepted by the reporting officers. Mr Borrie had proposed a maximum abstraction rate of 47 litres per second from well L37/0626. The reporting officers indicate that this flow rate is less than the maximum tested yield of the well, therefore, the abstraction rate would be reasonably obtainable.

The aspect of concurrent water supplies from other commercial water schemes for individual land parcels was also questioned in relation to comments by the applicant on this matter. We requested in further information, some feedback on a possible condition relating to concurrent use of groundwater with future “scheme” water for the requested consent. Upon examining the information provided to us by the reporting officers (which was reviewed by the applicant), we did not seek to apply such a provision to conditions of consent.

Given the above, and the mitigation proposed in the form of a daily and annual maximum volume of take, we agree that the adverse effect of inefficient take on other users is likely to be minor.

#### **Adverse effect of use of water on water quality**

The adverse effects of the use of water on the receiving environment (water quality) are dealt with specifically for: prescribed water quality standards to be met, promotion of land use practices and acceptable limits to effects of non-point discharges for groundwater quality.

It is noted that the application does fall into an area which has been identified as having some sensitivity to diffuse contaminant effects, and there are potentially many shallow wells drawing water from the Chertsey GAZ that are used for a potable drinking water supply. We also note that the application before us is for an established cropping and non-dairy cow grazing unit.

Mr Borrie provided a mass-mixing model assessment of potential increases in nitrate-nitrogen concentrations in the water table aquifer arising from the use of the requested irrigation water in conjunction with existing (farming) land uses. His assessment showed that nitrate concentrations would increase by 0.59 milligrams per litre, to bring the total concentration to 9.99 milligrams per litre. These increases are within those specified in Objective WQL2 of the PNRRP. The objective states that the down-gradient concentration of nitrate shall not increase by more than two milligrams per litre, and the maximum concentration shall not exceed 11.3 milligrams per litre.

The reporting officers have reviewed the applicant’s water quality assessment and agree that the potential effects upon water quality are likely to be minor. However, a condition precluding the use of water for the irrigation of pasture used to graze milking dairy cows was recommended to us. We agree with the suggested condition.

Ordinarily we would be concerned at the current level of nitrate within the water table aquifer, as it is suggested as being in excess of 80% of the NZ Drinking Water Standard MAV. However, as the nitrate assessment model predicts a relatively small increase and that there will be little change to the current land uses on the applicant's property, we consider that the potential effects of the proposed use of water upon water quality will likely be of a minor nature.

#### **Adverse effect of the take on Tangata Whenua values**

CRC had informed Te Runanga O Arowhenua in respect of the application upon receipt and again when the application was publicly notified. No such submissions on the application were received, and at the time the S42a report was prepared, there had been no response from Te Runanga O Arowhenua.

The reporting officers had stated in evidence that they were not aware of any impacts that the proposal may have on Tangata Whenua values given that in particular, effects on surface water flows and water quality have been assessed as minor. We concur with that position.

### **8. Objectives and Policies**

There are objectives and policies in the operative Regional Policy Statement (RPS) which are relevant to the taking and use of groundwater. The PNRRP contains much more focused policy provisions, but is at an intermediate statutory stage on its way to eventually becoming operative, so the weight that it can be given at this time is more limited. Although this is a matter for us to determine based on the relative merits of relevant policies and rules in the PNRRP in relation to this application.

As indicated earlier under the heading of "Statutory Provisions", the application of Section 88A of the Act to this application means it has to be assessed under the objectives and policies applicable at the time of notification. Within this GAZ, the taking of water for irrigation purposes is a non complying activity under Rule WQN22 of the PNRRP.

The taking of water for the intended purpose within a fully allocated "red zone" is subject to Objective WQN 3(b) and Policy WQN9 in the PNRRP, which states as follows;

*"Control the total amount of groundwater allocated for abstraction so that there is not a significant continuing long - term decline in mean annual groundwater levels and artesian pressures".*

The application may arguably be contrary to the GAZ policies that we may apply in this case. Similarly, it appears that the application may also be contrary to Policy WQN14 (9) (d) (i) in the PNRRP which addresses circumstances under which resource consents can be granted under allocation regimes. However, as eluded to in "Appearances" and "General" there are extenuating circumstances to be considered in relation to our determination under these policies.

In terms of effects of water takes on other groundwater users, Chapter 9, Policy 6 of the RPS states that;

*"In considering a permit to take water, a consent authority should, as part of the requirements of section 104 of the Act, consider the need to:*

.....

*(c) provide for existing water permit holders to have priority for the term of their permits"*

Policy WQN20 in the PNRRP specifies that any new well shall not have a direct cumulative interference effect of more than 20% on any other well within 2 km with an existing authorisation, unless that effect is mitigated. The evidence before us, considering both the information provided by Council Officers and the applicant's consultant, satisfied us that there would be no interference effect which would be more than minor resulting from the proposed take. This also extends to any potentially adverse effect upon existing applications within the Chertsey GAZ, ahead of this application, in the priority queue.

Turning to assessment of any potential adverse effects of an inefficient take on other groundwater users, Policy 3 in Chapter 9 of the RPS aims to *"promote efficiency of the use of water"*. This is supported by Objective WQN5 and Policy WQN17 in the PNRRP. Objective WQN5 seeks to;

*"achieve a high level of efficiency in terms of resource availability and the use of water"*.

Policy WQN17 sets out a range of criteria for the reasonable and efficient use of water including assessments of the rate and timing of abstractions, on-site physical factors, and irrigation application efficiency. The evidence presented to us, and supported in the Officer's reports, was that the proposed take and use of water involved in the application would be efficient.

Recognising that abstractions from groundwater can in some circumstances have an adverse effect on surface waterways, regard must be given to policies WQN3(2) and WQN8. Policy WQN3(2)(c) states that;

*"Controlling the taking and using of water from an individual bore or borefield where this causes a high or moderate stream depletion effect"*.

The evidence presented to us was that well L37/0626 was screened at depth (149 m below land surface) such that there would be no effects on surface waterways.

Finally, consideration has to be given to potential adverse effects of the use of water on water quality. This is addressed in general terms under Chapter 9, Objective 3 of the RPS, and under Chapter 4 (water quality) of the PNRRP. Chapter 9, Objective 3 in the RPS states as follows;

*"Enable people to gain benefits from the water quality in Canterbury water bodies while safeguarding: drinking water resources, life supporting capacity of water, Maori cultural values, preserving natural character, protecting habitat of trout and salmon".*

Objective WQL2 in Chapter 4 of the PNRRP contains objectives relating to groundwater quality, while Policy WQL12 refers to the need to avoid potential contamination of community drinking water sources. The application involved no proposed change of use on the property concerned. A groundwater nitrate assessment of the proposed activity also indicated a no more than minor impact upon the receiving environment. Accordingly we were satisfied that the application would not be contrary to objectives and policies relevant to water quality.

## **9. Part 2, Resource Management Act**

The purpose of the Act (Section 5) is to promote the sustainable management of natural and physical resources. This is defined as:

*"... managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural well-being and for their health and safety while –*

- (a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
- (b) Safeguarding the life - supporting capacity of air, water, soil, and ecosystems; and*
- (c) Avoiding, remedying, or mitigating any adverse effects of activities on the environment."*

The proposed taking and use of water sought through this application will enable the applicant, and indirectly the community, to provide for their social and economic well-being through either increased agricultural production, or increased security of water supplies supporting current levels of production. We are satisfied that the proposed taking and use of water sought through this application before us will sustain the potential of groundwater resources to meet the reasonably foreseeable needs of future generations, will safeguard the life supporting capacity of water, and avoid or mitigate any adverse effects on the environment subject to conditions of resource consent and in relation to matters of exception for this application.

The relevant matters under Section 7 that we are required to have particular regard to in this case are;

- "(b) the efficient use and development of an excellent physical resource;*
- (f) maintenance and enhancement of the quality of the environment; and*
- (g) any finite characteristics of natural physical resources"*

We are satisfied that the activity in the application presented will represent an efficient use and development of the groundwater resource, and will not result in an unsustainable abstraction from groundwater in the applicant's area.

On the evidence presented to us, it did not appear that the application would conflict with matters of significance to Tangata Whenua, and hence would not be inconsistent with Sections 6 (b) and 7(a) of the Act.

## **10. Section 104 Resource Management Act**

As noted earlier in this decision, the application has to be considered as a non-complying activity within the Chertsey GAZ. Section 104D of the Act applies to non-complying activities. We can only grant consent to a non-complying activity if the effects on the environment are of a less than minor nature, and the proposal is not contrary to the objectives and policies of the relevant planning instruments.

We were satisfied on the evidence before us that the proposed activity may have a less than minor effect on the environment in relation to localised site on site effects. In terms of groundwater zone allocation, we consider that the "exception" applies in this circumstance. That is, that all reasonable endeavours have been made by the applicant to confirm what was an existing lawful groundwater allocation within the Chertsey GAZ. Matters of clear communication and timing of events had led to what we see as an unfortunate situation with respect to securing any additional allocation under either replacement or any new-application process. Apart from this matter of exception when considering S104, we believe the proposal to be entirely consistent with the objectives and policies of the PNRRP and the TRP. Accordingly, we are satisfied that S104D tests have been met, and we have the discretion to either grant or decline the application with respect to the matters set out in Section 104.

Section 104 (1) states as follows;

*“(1) when considering an application for resource consent and any submissions received, the consent authority must, subject to Part 2, have regard to -*

- (a) any actual and potential effects on the environment of allowing the activity; and*
- (b) any relevant provisions of -*
  - .....*
  - (iii.) a regional policy statement or proposed regional policy statement:*
  - ..... and*
- (c.) any other matter that consent authority considers relevant and reasonably necessary to determine the application.”*

The effects of the proposed water take on the environment have been assessed earlier in this decision and have been found to be of a minor nature on the receiving environment with respect to localised site on site impacts. The proposal is consistent with the objectives and policies of the RPS and the PNRRP.

We consider that the “exception” in this case, clearly relates to allocation, and for the reasons contained within this decision in relation to this matter, we are satisfied that the application is consistent with Section 104 of the Act.

## **11. Review of Consent Conditions**

A review under Section 128 of the RMA is discretionary and is triggered by the Consent Authority to ensure that conditions do not become outdated, irrelevant or inadequate. It is not a mechanism that enables a Consent Authority to amend existing conditions or impose new conditions to prevent the activity for which the resource consent was granted.

Amendments to conditions are limited only to the extent that they do not prevent the activity for which consent has been granted, and in changing consent conditions Consent Authorities need to consider whether as a result of the change, the consent would still remain viable. Although this does not imply a limit on the power to amend.

We do note that the power to review conditions is at the heart of an adaptive management regime, as without the ability to reduce the effects of an activity through reducing its scale, there can be no adaptation to the subsequent identification of adverse effects arising out of the activity. The power of review allows a Consent Authority to consider changing conditions to make them more appropriate in the light of the circumstances triggering a review.

We also note other provisions in the RMA which particularly in the future may impact on this issue. Here we are referring to Section 68(7) and Section 130(5). Section 68(7) provides that where a regional plan includes a rule relating to maximum or minimum levels or flows or rates of use of water or minimum standards of water quality ... the plan may state:

- (a) Whether the rule shall affect, under Section 30, the exercise of existing resource consents for activities which contravene the rule; and
- (b) That the holders of resource consents may comply with the terms of the rule, or rules in stages or over specified periods.

Section 130(5) provides that if a regional plan states that a rule will affect the exercise of an existing consent under Section 68(7) the Consent Authority is not required to comply with Section 93(2) or Section 94(1) but must hear submissions only from the consent holder that the consent holder so requests, within 20 working days of service of the notice under Section 129 to be heard.

We note that there are similar provisions in Section 128 of the RMA in relation to a water permit when a regional plan has been made operative which sets rules relating to maximum or minimum levels or flows or rates of use of water and other matters. In that circumstance in the Regional Council’s opinion, if it is appropriate to review the conditions of the permit in order to enable the flows, levels, rates or standards set by the rules to be met, it may do so. This of course is different from the power provided in Section 67 and Section 130 and it is a matter in the Regional Council’s discretion to exercise that power or not.

We note within the PNRRP under regional rules page 5-124, item 5.6 that rules 6-11 inclusive and rules 19-29 inclusive shall affect under Section 130 the exercise of existing resource consents for the taking, diverting or using of surface water or groundwater. The water permits will be reviewed in order to enable flows or levels set in Schedules WQN1 or WQN3 to be met. It is further noted that the plan provides conditions addressing rates of use (including annual volume) and water measurement and recording may also be reviewed to allow conditions in Schedule WQN9, Schedule WQN11 and Schedule WQN13 to be met.

The plan also provides that when the above mentioned rules become operative, CRC may serve notice under Section 128 of the Act on holders of all such consents, of its intention to review the conditions of the resource consents where in the Council's opinion, it is appropriate to do so in order to enable the standards set by each rule to be met.

The PNRRP is a notified plan, and these rules and policies and objectives which support those rules are in receipt of submissions, and the final position of the PNRRP on these matters will be determined as a result of that review process. While we cannot surmise as to the outcome of that review process we do note the existence of these statutory provisions and the fact that these provisions have been referred to in the PNRRP.

## **12. Duration**

Our decision concludes that this consent to take groundwater from the Chertsey GAZ be granted for a maximum period of 10 years.

We consider that the period of 10 years is appropriate having regard to the sequence of factors to be considered, as laid out in Section 1.3.5 of Chapter 1 of the PNRRP which provides:

- "(a) The nature and sensitivity of the affected environment, including:*
- (i) the degree to which the sensitivity of the affected environment may become more sensitive over time; and*
  - (ii) the risk of unforeseen adverse effects arising from the consented activity and;*
  - (iii) the level of knowledge about the affected environment".*

The consideration of the PNRRP WQN4 analysis implies that with over allocation and intensive abstraction in certain areas of the Chertsey GAZ, there may be adverse effects, and as such, must be effectively managed through resource consents.

The applicant has requested 10 years for any duration of resource consent. Recognising the nature of the environment and the precedents set in terms of recent court decisions on groundwater takes in highly allocated groundwater zones of Canterbury, we find that a 10-year duration is entirely applicable here.

### 13. Determination

Accordingly it is our decision that pursuant to Sections 104, 104D and 108 of the Resource Management Act 1991, this application is granted consent for a duration of 10 years on the specific terms and conditions as set out in Annexure 1 for CRC071927 (HG Campbell).

**DATED** the 30<sup>th</sup> day of March 2009



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A L Withy, Commissioner



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T B Heller, Commissioner

## ANNEXURE 1

### CRC071927 (HG Campbell)

#### Conditions:

- 1) Water may be taken only from bore L37/0626, 300 millimetres diameter and 149 metres deep, at map reference NZMS 260 L37:30861-06997.
- 2) Water may be taken at a rate not exceeding 47 litres per second, with a volume not exceeding 3,892 cubic metres per day, and 447,150 cubic metres between 1st July and the following 30th June.
- 3) Water shall only be used for irrigation of crops and pasture for grazing stock, excluding milking dairy cows, as described in the application, on the area of land shown in attached plan CRC071927, which forms part of this consent.
- 4) The consent holder shall, before the first exercise of this consent, install an easily accessible straight pipe(s), with no fittings or obstructions that may create turbulent flow conditions, of a length at least 15 times the diameter of the pipe, as part of the pump outlet plumbing or within the mainline distribution system.
- 5) The consent holder shall before the first exercise of this consent:
  - (a)
    - (i) install a water meter(s) that has an international accreditation or equivalent New Zealand calibration endorsement, and has pulse output, suitable for use with an electronic recording device, which will measure the rate and the volume of water taken to within an accuracy of plus or minus five percent as part of the pump outlet plumbing, or within the mainline distribution system, at a location(s) that will ensure the total take of water is measured; and
    - (ii) install a tamper-proof electronic recording device such as a data logger(s) that shall time stamp a pulse from the flow meter at least once every 60 minutes, and have the capacity to hold at least one season's data of water taken as specified in clauses (b)(i) and (b)(ii), or which is telemetered, as specified in clause (b)(iii).
  - (b) The recording device(s) shall:
    - (i) be set to wrap the data from the measuring device(s) such that the oldest data will be automatically overwritten by the newest data (i.e. cyclic recording); and

- (ii) store the entire season's data in each 12 month period from 1 July to 30 June in the following year, which the consent holder shall then download and store in a commonly used format and provide to the Canterbury Regional Council upon request in a form and to a standard specified in writing by the Canterbury Regional Council; or
    - (iii) shall be connected to a telemetry system which collects and stores all of the data continuously with an independent network provider who will make that data available in a commonly used format at all times to the Canterbury Regional Council and the consent holder. No data in the recording device(s) shall be deliberately changed or deleted.
  - (c) The water meter and recording device(s) shall be accessible to the Canterbury Regional Council at all times for inspection and/or data retrieval.
  - (d) The water meter and recording device(s) shall be installed and maintained throughout the duration of the consent in accordance with the manufacturer's instructions.
  - (e) All practicable measures shall be taken to ensure that the water meter and recording device(s) are fully functional at all times.
- 6) Within one month of the installation of the measuring or recording device(s), or any subsequent replacement measuring or recording device(s), and at five-yearly intervals thereafter, and at any time when requested by the Canterbury Regional Council, the consent holder shall provide a certificate to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, signed by a suitably qualified person certifying, and demonstrating by means of a clear diagram, that:
- (a) The measuring and recording device(s) has been installed in accordance with the manufacturer's specifications; and
  - (b) Data from the recording device(s) can be readily accessed and/or retrieved in accordance with clauses (b) and (c) of condition (5).
- 7) The Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, shall be informed immediately on first exercise of this consent by the consent holder.
- 8) The taking of water in terms of this permit shall cease for a period of up to 48 hours, on notice from the Canterbury Regional Council, to allow measurement of natural groundwater levels.
- 9) (a) If the irrigation system used to distribute water taken in terms of this permit is used to distribute effluent, fertiliser or any other added contaminant, a backflow preventer manufactured in accordance with AS 2845.1 (1998) or the American Society of Sanitary Engineers standards shall be installed within the pump outlet plumbing or within the mainline, to prevent the backflow of water into the bore.

- (b) The backflow preventer shall be tested to the standard set out in AS 2845.3 (1993) or an equivalent method within one month of its installation and annually thereafter by a suitably qualified person. A test report shall be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within two weeks of each inspection.
- 10) The consent holder shall take all practicable steps to:
  - (a) Ensure that the volume of water used for irrigation does not exceed that required for the soil to reach field capacity; and
  - (b) Avoid leakage from pipes and structures; and
  - (c) Avoid the use of water onto non-productive land such as impermeable surfaces and river or stream riparian strips.
- 11) (a) The standing water level, relative to ground level, in bore L37/0626 shall be measured as follows:
  - (i) once at the start of the irrigation season before pumping has commenced;
  - (ii) once two days after the cessation of pumping at the end of the irrigation season; and
  - (iii) once within the first seven days of each calendar month outside of the irrigation season.
- (b) All measurements of the standing water level and date of measurement shall be recorded in a log book kept for that purpose, and supplied to the Canterbury Regional Council, attention RMA Compliance and Enforcement Manager, each year during the month of June, or when requested in writing.
- 12) The Canterbury Regional Council may, once per year, on any of the last five working days of May or November, serve notice of its intention to review the conditions of this consent for the purposes of dealing with any adverse effect on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage.
- 13) The lapsing date for the purposes of section 125 shall be 30 March 2014.

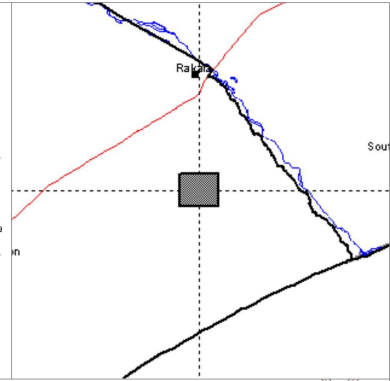
# Plan CRC071927

## H G Cambell

Produced by: Susannah  
Date: 6/10/2008 11:30:07 a.m.  
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This plot was created using information from Environment Canterbury's records. It is supplied in good faith, and every effort has been made to insure the accuracy of the information shown. However its accuracy and completeness is not guaranteed. If the information shown is relied on in support of a resource consent application it should be verified independently.

TA BOUNDARIES  
ROADS  
Road centres from National Road Centre Database (NRCD). The representation in a NRCD dataset of a road or track does not necessarily indicate a public right of way.  
LANDPARCELS  
Land parcel boundaries from LINZ CRS database.  
WELLS (READING COUNT) (READING\_COUNT)  
Well locations accurate to ±100m.



Shaded area indicates 110 hectares to be irrigated.

