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# BARRHILL CHERTSEY IRRIGATION LIMITED – ANNUAL REPORT

CRC147697 ANNUAL REPORT 2015

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## 1. INTRODUCTION

Barrhill Chertsey Irrigation Limited (BCI) hold resource consent CRC147697 to permit shareholders from BCI and Acton Farmers Irrigation Co-Operative (AFIC) to collectively discharge up to 2,981 tonnes N/year to groundwater from 40,000 ha of farming activities within the Ashburton District.

Currently BCI provides up to 3 m<sup>3</sup>/s of water to AFIC to irrigate approximately 6,000 ha within the Dorie/Pendarves area.

All existing shareholders from both schemes were required to complete individual Farm Environment Plans (FEP) by 10 September 2015 and be audited within 12 months. New shareholders need to complete an FEP prior to using water.

An annual report is due 31 August each year to provide a summary of FEP audit results. No audits have yet been completed as they will commence in the 2015-16 season.

The following is a summary of compliance of consent conditions for shareholders from both BCI and AFIC irrigating in the 2014-15 season and includes:

- V6.2 OVERSEER updated Nitrogen Discharge Allowance
- Updated Scheme Management Plan

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## 2. CONDITIONS SUMMARY

### CONDITION 1

*This consent authorises:*

- a. the use of land for farming; and*
- b. the discharge of nutrients to water arising from the use of farming authorised in clause a.*

No comment required.

### CONDITION 2

*The use of land and discharge specified in condition 1. shall only occur within a maximum of 40,000 hectares on:*

- a. the areas marked as Areas 1-8 on attached plan CRC141388, which forms part of this consent; and*
- b. any land located between the Rakaia and Rangitata Rivers covered by a separate consent to use water that has been taken under CRC132861 or any subsequent variation thereof.*

BCI water is irrigated onto 152 properties through BCI and AFIC irrigation schemes between the Rakaia and Rangitata Rivers (blue properties seen in Figure 1). Approximately 43% of properties irrigated with BCI water also received water from another source. The "Primary Water Sources" map (Figure 2) shows the main water source for BCI and AFIC shareholders.

The "BCI Irrigated Area" was calculated using two methods:

1. Where BCI water was used to irrigate a particular area; the actual area irrigated by BCI was used.
2. Where BCI water was mixed with other sources of water; the BCI irrigated area was calculated using the relative proportion of water by flow rate. E.g. if 50 l/s comes from BCI and 25 l/s from groundwater, then 2/3rd of the total irrigated area is attributed to BCI.

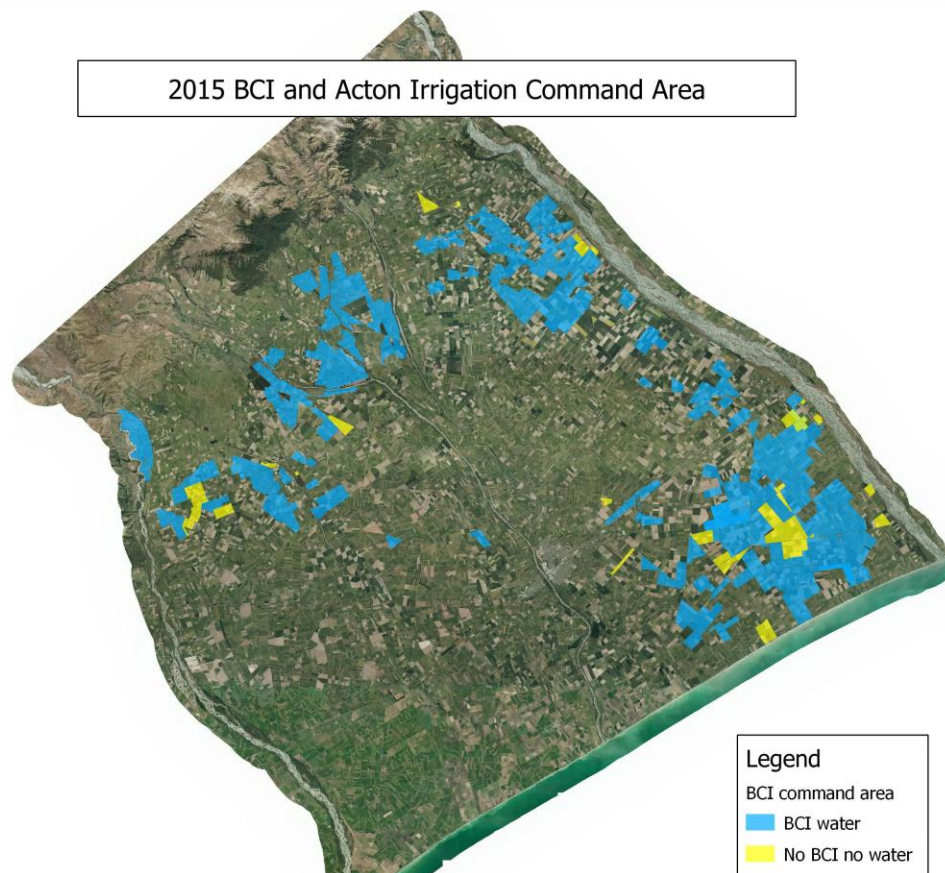
The total estimated area irrigated using BCI water during the 2014-15 irrigation season was 17,978 ha.

It is anticipated a further 4,500 ha will start to be irrigated by BCI in the 2015-16 season, bringing the estimated total of the scheme to 22,478 ha.

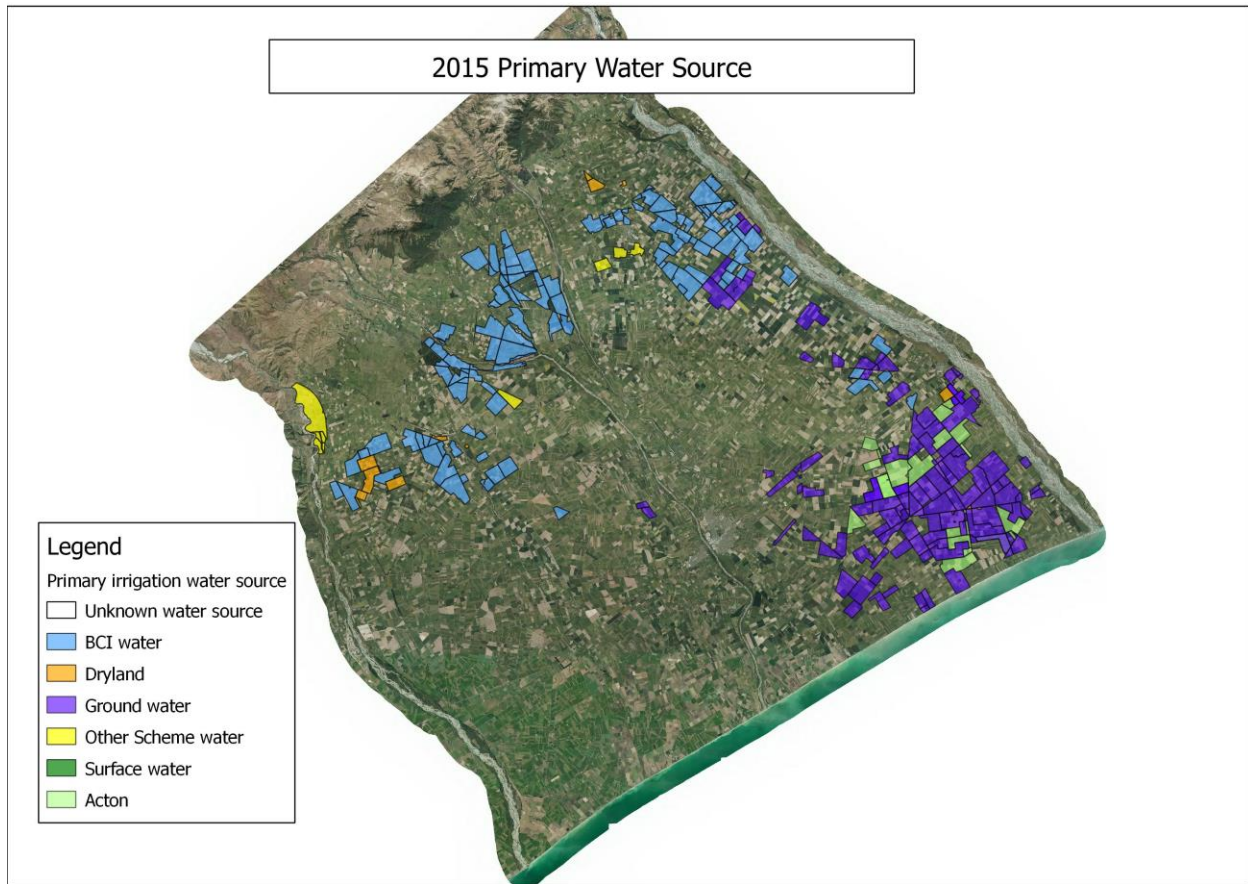
**TABLE 1: SUMMARY OF AREAS MANAGED UNDER CONSENT**

	2015 Measured Area	Estimated Area*
<b>Total FEP Managed Area (ha)</b>	40,173	20,420
<b>Total Irrigated Area (ha)</b>	29,238	20,420
<b>BCI Scheme Irrigated Area (ha)</b>	12,704	12,456
<b>AFIC Scheme Irrigated Area (ha)</b>	5,274	5,148
<b>Total BCI Irrigated Area (ha)</b>	17,978	17,604

\*From consent application



**FIGURE 1: BCI AND ACTON IRRIGATED PROPERTIES**



**FIGURE 2: PRIMARY WATER SOURCE FOR BCI SHAREHOLDERS**

### CONDITION 3

*A Farm Environment Plan (FEP) shall be prepared:*

- a. by 10 September 2015 for any properties that had existing water supply agreements with the consent holder that were in place prior to July 2013; and*
- b. for any properties with agreements subsequent to those specified in clause a., prior to the delivery of water to that property.*

*The FEP shall be prepared in accordance with Schedule One, which forms part of this consent. The FEP shall be updated as necessary and on farm practice shall be in accordance with the FEP.*

All BCI and AFIC shareholder FEPs were completed using the approved Rangitata Diversion Race (RDR) Rubicon online template, which was reviewed as meeting Schedule 7 of the Land and Water Regional Plan by Environment Canterbury in 2014. Some modifications of the RDR template were made to improve usability and include BCI specific requirements. The changes were:

- Section 2: Contact info – allowed more contact information and clarification of who's details should be included
- Section 4: Property information – include legal description
- Section 6: Land Use – removed requirement to report land use by area to “primary”, “secondary” and “other” land uses.
- Section 7 resource consents – more comprehensive list of resource consents and compliance risk assessment included
- Section 8: Irrigation Systems – modified to include more information in line with OVERSEER 6.2 update
- Sections 14 – 18: Risk Management – deleted repeated questions, include automated responses and included questions relating to BCI related good management practices.

None of the modifications impacted on Schedule 7 requirements.

#### **Existing Shareholder FEPs**

A total of 146 FEPs needed to be completed to Schedule 7 requirements by 10 September 2015. Of the 146 shareholdings, 6 were held by dry shareholders – those who have shares prior to July 2013 but have not yet started to take water. No FEPs were prepared for these shareholders.

Shareholders were requested to submit their online FEPs for review by the 15 August 2015. All but 7 made this timeframe. The remaining 7 were issued with formal warnings, with a request to complete their FEPs by 18 September 2015. Of the 7, 2 have failed to submit their FEPs within the requested timeframes and have been advised they will be unable to access BCI water until their FEPs have been submitted and reviewed.

All FEPs submitted have been reviewed to ensure Schedule 7 requirements have been met. Of the 133 submitted on time, 108 currently meet the requirements. The remaining 25 have been returned to the shareholders with a request for further information.

#### **2015-16 Season Shareholders**

A total of 45 new shareholdings have been purchased and due to start irrigating with BCI in the 2015-16 season. All new shareholders have been advised they will be unable to access BCI water until their FEPs have been submitted and reviewed as meeting requirements.



### **Note for FEP Managed Area**

Many shareholders use multiple sources of water on their property through a single irrigation system and therefore it was impractical to exclude these areas from the Farm Environment Plan. Shareholders were also encouraged to assess their enterprise as a whole and permitted to include properties not irrigated by BCI within their FEP. For these reasons, the FEP areas managed and audited far exceed initial estimations.

## **CONDITION 4**

### **Audited Self Management Programme**

- a. *The consent holder shall implement an audited self management programme (ASM) which is approved by the Canterbury Regional Council. This shall include an audit undertaken by an appropriately qualified person annually, except as provided for in clause b. The purpose of the audit shall be to determine the compliance of the FEP with the provisions of Schedule One and on farm practise with the provisions of the FEP;*
- b. *Where full compliance of the FEP with the provisions of schedule One and on farm practise has been achieved for the previous three audits, the audit specified in a. shall only be required once every three years;*
- c. *Each farm must be audited by an independent external auditor at least once every three years;*
- d. *The consent holder shall prepare an annual report describing the results of the ASM programme and the audits that have been conducted each year. The report shall include a record of the audit compliance grading and the annual loss of nitrogen for each audited property. A copy of the annual report shall be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager by 31 August each year;*
- e. *A copy of each FEP and audit shall be provided to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager upon request.*

Farm Environment Plan audits are due to start in October 2015, in accordance with the Scheme Management Plan (SMP). Audits will be completed against the shareholder's FEP and include all properties managed under the plan.

A copy of the updated SMP is attached in Appendix 1: Updated Scheme Management Plan

A change of conditions application will be made to align condition 4 with the newly developed regional auditing strategy, whereby the audit frequency will be determined by the performance of the property.

Audits will C or D grades will be followed up by Eva Harris, Environmental Manager of Irrigo Centre Limited, in accordance with the SMP.

A full summary on FEP compliance will be included in next year's annual monitoring report.

## CONDITION 5

*The combined average annual amount of nitrogen lost to water as calculated from the individual Farm Environment Plans prepared in accordance with condition 3. shall not exceed a total of 1,232 tonnes if Overseer version 6.0.3 is used or X tonnes if a subsequent Overseer version, or equivalent model approved in writing by the Canterbury Regional Council RMA Compliance and Enforcement Manager is used. For the purposes of this condition, X equals the total average annual nitrogen loss calculated using the current version of Overseer, or equivalent model approved in writing by the Canterbury Regional Council RMA Compliance and Enforcement Manager, based on the following:*

- a. 17,604 hectares of land with irrigation supply agreements in place with the consent holder prior to July 2013; and*
- b. 22,396 hectares of subsequent irrigation areas;*

*Provided that the land uses and management practices modelled must be consistent with the activities described in the application.*

### **Updated N load Limited with OVERSEER 6.2**

The OVERSEER model was updated to v6.2 in April 2015 to include a more detailed irrigation module. All previous OVERSEER models assumed best irrigation management practice and therefore most farms saw a significant increase in their N loss figures.

PDP were employed in July 2015 to update the background files and recalculate the nitrogen discharge allowance (NDA) using the most recent version of OVERSEER. A copy of the PDP report is included as Appendix 2: Revised N Load Calculation – v6.2 OVERSEER

The recalculated NDA, was **2,981 tonnes N/year**, assuming 1,635 tonnes N/year from existing shareholders and 1,346 tonnes N/year for new shareholders. The N loading limit assumed a total of 40,000 ha irrigated by BCI.

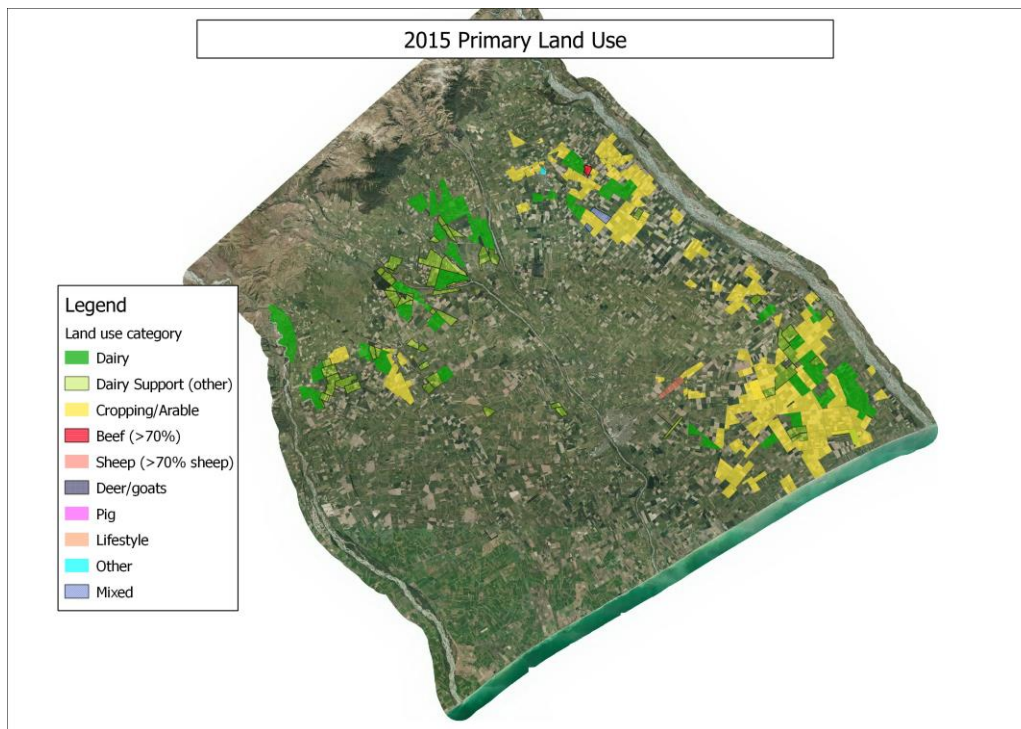
Land use estimates were consistent with the original NDA calculation. Actual 2015 Primary Land use is summarised in Table 2 and Figure 2.

**TABLE 2: PRIMARY LAND USE DISTRIBUTION**

	2015 Primary Land Use	Estimated Land Use*
<b>Arable</b>	54%	38%
<b>Dairy</b>	29%	40%
<b>Dairy Support</b>	16%	18%
<b>Other</b>	1%	4%

\*From consent application





**FIGURE 3: 2015 PRIMARY LAND USE FOR BCI SHAREHOLDERS**

### 2014-15 Season N loss

All current shareholders from both BCI and AFIC completed an OVERSEER nutrient budget using v6.2 and data from the 2014-15 irrigation season. All nutrient budgets were prepared by a suitably qualified professional in accordance with the Best Practice Input Standards (April 2015) where possible, or an explanation provided as to why deviation was necessary.

All nutrient budgets were prepared for the whole property. As mentioned in condition 2, many properties irrigated by BCI were also irrigated by other sources of water. The total N loss used to calculate the BCI NDA load was proportional to the amount of water the scheme provided for the property. E.g. if BCI supplies 50% of water to the property, then 50% of the N load was added to the NDA.

Four arable and mixed stock properties were unable to complete nutrient budgets due to bugs in OVERSEER. In each instance, nutrient management advisors within Ravensdown were unable to fix the errors and requested assistance from OVERSEER, who were unable to overcome the issues. A declaration from Ravensdown is available where a nutrient budget is unable to be prepared. The nutrient allocation for the property was used to estimate the N loss contribution for these properties. The anticipated April 2015 arable module upgrade should resolve many issues with completing the nutrient budgets.

Table 3 compares the anticipated N loss per scheme with the 2014-15 N loss totals.

The calculated N loss for all current shareholders in the 2014-15 season was **1,241 tonnes N/year**, below the 1,635 tonnes N per year estimate.

**TABLE 3: SUMMARY OF 2015 N LOSS FOR SCHEME**

	2015 Measured N Loss for current shareholders	Estimated N Loss for current shareholders*
<b>Total FEP Managed N Loss (tonnes N/year)</b>	2,420	
<b>BCI Scheme N Loss (tonnes N/year)</b>	944	1,350
<b>AFIC Scheme N Loss (tonnes N/year)</b>	297	285
<b>Total BCI N Loss (tonnes N/year)</b>	1,241	1,635

\*Updated N loss calculated in Appendix 2 attached.

## CONDITION 6

*The consent holder shall ensure that each farm that it supplies water to shall maintain detailed records of fertiliser application rates, location and crop type (including winter feed/forage crops), cultivation methods, stock units by reference to type and breed, and all other inputs to the Overseer nutrient budgeting model. The records shall be made available to the Canterbury Regional Council on request.*

All shareholders are aware of the requirements to improve records used to provide an OVERSEER nutrient budget annually.

## CONDITION 7

*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.*

No comment required.



