

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

IN THE MATTER OF The Resource Management Act
1991

AND

IN THE MATTER OF Applications CRC082300, by
Pukaki Irrigation Company
Limited for a permit to disturb the
bed and banks of four ephemeral
streams to install an irrigation
supply pipeline

Section 42A Officer's Report by Maria Bartlett

Date of Hearing: 21 September 2009

1. Pukaki Irrigation Company Limited proposes to install infrastructure for a new irrigation scheme, to be utilised by three properties to the south of Lake Pukaki. See Attachment One for a diagram showing the relationship of applications in process for the Pukaki Irrigation Scheme.
2. This report should be read in conjunction with reports prepared for associated water permit applications CRC082304 from Simons Hill Station Limited, CRC082311 from Simons Pass Station Limited, CRC083609 from Glentanner Station Limited, and CRC070406 from Classic Properties Limited, as they propose to utilise the irrigation scheme infrastructure to be installed by Pukaki Irrigation Company Limited.
3. This report should also be read together with the introductory s42A report which gives an overview of all applications presented at this hearing (Report 1), the planning and technical reports on hydrology and minimum flows (Report 2A and 2B), the planning report outlining annual allocations (Report 3) and the reports on cumulative landscape and water quality effects in the catchment (Reports 4 and 5).

INTRODUCTION

4. Pukaki Irrigation Company Ltd (the applicant) has applied for resource consent to:

CRC082300

construct and maintain a pipeline under four unnamed ephemeral streams, to enable a water supply to pass under the streams, between map references NZMS 260 H38:878-657 and H38:879-657; NZMS 260 H38:845-641 and H38:846-641; NZMS 260 H38:848-642 and H38:849-642; and NZMS 260 H38:861-643 and H38:862-643; adjacent to Lake Pukaki, State Highway 8, south of Tekapo Stilling Basin

See the maps in Attachment Two for location of the proposed activities.

5. The applicant engaged Aqualinc Research Limited to prepare the application and assessment of environmental effects, and SolutionNZ RM Limited to provide further information.
6. A 35 year duration is sought.

7. This is an application for a new activity.
8. A site visit was carried out on 4 December 2008, by consents staff of Canterbury Regional Council, with Peter Glasson representing Pukaki Irrigation Company Limited. Photographs are not included from the site visit. Attachment Three includes photographs provided by the applicant.

Background

9. Application CRC082300 was lodged on 21 December 2007, at the same time as water permit applications CRC082304 from Simons Hill Station Limited and was considered to be notifiable from the date of lodging.
10. CRC082300 relates to a proposal to take water from the Tekapo Stilling Basin and gravity feed it through a buried pipeline to the areas of irrigation on Simons Hill Station, Simons Pass Station, Glentanner Station and Maryburn Station, which represents Option 3 for the Pukaki Irrigation Company Limited irrigation supply scheme. Consent is not required for the intake from Tekapo Stilling Basin, as this is an artificial watercourse, but is required for placement of structures within the bed of four ephemeral streams.
11. Alternative intake locations for the proposed irrigation supply scheme from the Pukaki Canal (Option 1) or Lake Pukaki (Option 2) and routes for a proposed open race system are covered by applications CRC062866, CRC062870, CRC062871, CRC062872, lodged by Pukaki Irrigation Company Limited on 14 February 2006 (as outlined in Report 31a).
12. All three possible intake locations and supply routes are proposed as options, and the applicant will choose the most viable option, at which point application CRC082300 may no longer be required, if the Pukaki Canal or Lake Pukaki options are successful. The outcome of the Pukaki Irrigation Company Limited infrastructure applications will contribute to the decision regarding water permit applications lodged by Simons Hill Station Limited (CRC062842, CRC082304), Simons Pass Station Limited (CRC062867, CRC082311), Glentanner Station Limited (CRC071362, CRC083609) and Classic Properties Limited (CRC070406).
13. Regarding CRC082300, on 21 June 2009 the applicant confirmed that the pipeline crossing point over the first ephemeral stream would not be at the notified location of between NZMS 260 H38:884-662 and H38:885-662, but at a site approximately 800 metres downstream of the notified location, between NZMS 260 H38:878-657 and H38:879-657. This change to the intake location was not considered cause for further notification of the application, as there is little difference in effects between locations, and there are no parties adversely affected by the change who had not already submitted on the application. The applicant specified the reason for changing the crossing point as a change in proposed pipeline route that would be a more direct and efficient route from the Tekapo Stilling Basin to the Pukaki outwash flats on Simons Pass Station and Simons Hill Station. Attachment Two shows the original and revised pipeline routes.

Notification and Submissions

14. Application CRC082300 was publicly notified on 18 October 2008. Details of the notification and wording are contained in Appendix 4 of the introductory s42a report (Report 1).

15. The application attracted 8 submissions, as follows:
- (a) 2 were in support;
 - (b) 6 in opposition; and
 - (c) 0 neither supported nor opposed the application.

16. All submissions received for this application are summarised below.

Submitter	Issues	Support/Neutral/Oppose	To be heard
Canterbury Aoraki Conservation Board	Sections 6, 7 and 8 of the RMA to be considered; request a financial commitment to fund research that will monitor the effect on water quantity available in adjoining creeks, streams, ponds and wetlands.	Oppose	No
Fish and Game New Zealand – Central South Island Region	Cumulative effects; term of consent; review clauses; timing of instream works and amenity values	Oppose	Yes
Department of Conservation - Twizel	Inconsistent with Part II of the RMA; deficient AEE; effects on ecosystems and water quality; preservation of natural character; fish passage	Oppose	Yes
Land Information New Zealand – Murray Mackenzie	Land may require easements on Crown pastoral lease land	Oppose	No
Meridian Energy Limited	Effects on Meridian infrastructure	Oppose	Yes
Irishman Creek Station Limited	Proposed pipeline crosses Irishman Creek Station, no contact from applicant; adverse effects include visual scarring, effects on vegetation, disruption of farming activities, risk of weeds spreading	Oppose	Yes
Ruataniwha Farm Limited	Will turn a desert into an oasis; no harm to the streams	Support	No
Mr A J Gloag	No negative consequences for the natural resource and make the physical resource more sustainable	Support	No

Table 1: Summary of submissions on application CRC082300

DESCRIPTION OF THE PROPOSED ACTIVITY

17. The applicant has applied to carry out the proposed activities under the following conditions:

CRC082300

- (a) To construct and maintain a pipeline under four unnamed ephemeral streams, to enable a water supply to pass under the streams, between map references NZMS 260 H38:878-657 and H38:879-657 (Crossing Point 1); NZMS 260 H38:845-641 and H38:846-641 (Crossing Point 2); NZMS 260 H38:848-642 and H38:849-642 (Crossing Point 3); and NZMS 260 H38:861-643 and H38:862-643 (Crossing Point 4);

- (b) Works shall be limited to the placement and maintenance of a pipeline beneath the bed of ephemeral streams;
- (c) To excavate a trench approximately 3 metres wide, up to 4 metres deep and up to 15 metres long in the bed of the first ephemeral stream at Crossing Point 1;
- (d) To excavate a trench approximately 3 metres wide, up to 3 metres deep and between 10 metres and 25 metres long in the bed of the ephemeral streams at Crossing Point 2, Crossing Point 3 and Crossing Point 4;
- (e) To install a pipeline of up to 1200mm diameter, up to 2 metres below bed level, in the bed of the first ephemeral stream at Crossing Point 1;
- (f) To install a pipeline of up to 300mm diameter, up to 2 metres below bed level, in the bed of ephemeral streams at Crossing Point 2, Crossing Point 3 and Crossing Point 4;
- (g) To undertake works when the stream beds are dry;
- (h) To backfill the trench, compact and level it, to resemble the surrounding stream bed;
- (i) To undertake works such that disturbance of the bed is minimised;
- (j) To undertake remedial works to restore bank stability where disturbance occurs to the stream banks;
- (k) To undertaken works such that they do not cause erosion to the bed and banks of ephemeral streams;
- (l) To thoroughly wash machinery off-site prior to working work in the bed or banks of the lake, in accordance with Canterbury Regional Council guidelines;
- (m) To implement measures to minimise discharge of sediment to air at the site;
- (n) To complete works within one week at each site;
- (o) To undertake works during the hours of 7am and 7pm on week days, and not on weekends or public holidays;
- (p) To advise Canterbury Regional Council and Upoko Runanga of any disturbance of Koiwi Tangata (human bones) or taonga (artefacts) and cease excavation until Kaumatua and archaeologists have certified it is appropriate for works to recommence at the demarcated site;
- (q) To provide a copy of the consent to any person exercising the consent and explain how to comply with conditions;
- (r) To advise Canterbury Regional Council two days prior to the start of works, if required
- (s) To undertake all practicable measures to minimise adverse effects on property, amenity values, wildlife, vegetation and ecological values;
- (t) To remove all spoil and other waste material from site upon completion of works;

- (u) To restore the site to its original condition, as far as practicable, upon completion of works;

LEGAL AND PLANNING MATTERS

Consent Requirements

- 18. The consent requirements under the Resource Management Act (RMA), Transitional Regional Plan (TRP) and Proposed Natural Resources Regional Plan (PNRRP) for land use permits are outlined in the introductory s42A report.
- 19. The applications were lodged on 21 December 2007 so both the TRP and PNRRP are applicable when determining status of the proposed activities.
- 20. The TRP does not address matters relating to works in the bed and banks of rivers and lakes in the Waitaki Catchment. As there is no operative regional plan which addresses certain uses of beds of lakes and rivers in the Mackenzie Basin, the proposed activity is a **discretionary** activity and requires resource consent under section 77C(1)(a) of the RMA.
- 21. The proposed PNRRP can be used for guidance when considering an application for works in the beds and margins of lakes and rivers. It is not clear that the proposed activities can comply with permitted activity rules BLR2 or BLR3. As such, the proposed activity is a **discretionary** activity in accordance with Rule BLR8 of the proposed NRRP.

Additional Requirements

- 22. The applicant is also likely to require easements and consent from the Commissioner of Crown Lands to undertake the proposed works.

CONSULTATION

- 23. The applicant has been in consultation with Meridian Energy Limited regarding the intake design, Land Information New Zealand regarding further authorisations that may be required, Department of Conservation regarding ecological values and Transit New Zealand regarding effects on State Highway 8. Details of consultation have not been provided.

DESCRIPTION OF THE AFFECTED ENVIRONMENT

24. *Ephemeral Streams*

- a) The applicant states:
 - i. The bed of the first ephemeral stream is approximately 12 metres wide at Crossing Point 1, and carries a flow of approximately 25 litres per second for up to 2 weeks in winter, which has happened only once in the last 15 years, infiltrating to groundwater before reaching Pukaki River.
 - ii. The beds of ephemeral streams at Crossing Point 2, Crossing Point 3 and Crossing Point 4 are between 5 metres and 22 metres wide;

- iii. There are a total of three ephemeral streams crossed by the pipeline, two of which are tributaries of the first ephemeral stream and have similar flow rate and frequency;
 - iv. Stream crossing points are stony, with vegetation of mainly hieracium, browntop and danthonia, barely distinguishable from the surrounding landscape, with low environmental value.
- b) I note that:
- i. The width of the first ephemeral stream at Crossing Point 1 and Crossing Point 4 appears to be greater than estimated by the applicant, based on aerial photographs in the CRC GIS system.
 - ii. Crossing Point 3 appears to be related to a topographical map reference, while aerial photographs do not show a distinguishable channel in this location, and photographs provided by the applicant of this site lack an obvious channel, in comparison to other sites where land form and vegetation tend to indicate a likely flow path.
 - iii. Native species are expected to be present within, and adjacent to, the ephemeral stream beds, including indigenous flora, invertebrates, lizards and birds¹.
 - iv. Test pit excavations, up to 5m deep, undertaken by Riley Consultants for Pukaki Irrigation Company Limited (applications CRC062866, CRC062870, CRC062871, CRC062872) found that outwash gravels located within the bed of ephemeral watercourses crossed by the proposed irrigation supply canal were moist or occasionally saturated.

ASSESSMENT OF PROPOSED ACTIVITY

- 25. The proposed water permit is a discretionary activity and must be considered in the context of s104 of the RMA.
- 26. Section 104(1) outlines matters that the consent authority must have regard to when considering an application for resource consent, including any actual and potential effects on the environment, any relevant statutory provisions, and any other matter the consent authority considers relevant.

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

- 27. The effects that have been considered for this type of activity (surface water abstraction) are presented in the introductory s42A report. That report includes the presentation of the relevant planning provisions which direct us to consider these effects. A summary table regarding the assessment of individual effects for this application is provided below and a detailed discussion of those outstanding matters or areas of concern is provided in the following sections.
- 28. Where mitigation is referred to in this table, I am referring to the recommended conditions listed at the end of this report. The recommended conditions take into

¹ Department of Conservation, Conservation Resources Report – Simons Pass, prepared for Land Information New Zealand (May 2008)

consideration those proposed by the applicant, however may have been re-worded or replaced by conditions used by Environment Canterbury.

Table 1: Summary of potential adverse effects from this application			
Adverse Effects	Applicant's assessment	IO audit	Conclusion
Water quality and ecosystems	Works undertaken when streams are dry; no ecological values affected	Agree that sediment discharge not an issue; washing equipment appropriate to avoid spread of pest plants; identification of native flora prior to works appropriate; avoid nesting birds; use established tracks Conditions (5)-(11) & (13)	Effects minor, subject to conditions
Bed erosion and flooding	Buried pipeline installed at depth of 1-2 metres below bed level sufficient to protect against flood flow; no effects on flood carrying capacity; remedial works to be undertaken if bank stability is affected; trench backfilled and compacted, levelled to surrounding bed contour	No concerns, provided conditions adhered to Conditions (1), (2), (5), (12), (15)-(17)	Effects minor, subject to conditions
Artificial structures	No assessment	Pipeline crosses under transmission line, not directly applicable to stream crossing points (nearest is approximately 400m away), but a consequence of granting consent (2)	Effects minor
Amenity values	No amenity values identified	Stream beds are located on pastoral land with few manmade elements; sites restored after works; pipeline to be buried, although the AEE notes that there may be some exposed sections along the pipeline route Conditions (1), (2), (11), (15) & (16)	Effects uncertain
Tangata Whenua values	Accidental discovery protocol to be observed	Accidental discovery protocol appropriate; Ngai Tahu have not submitted on this application Condition (14)	Effects minor

Table 2: Summary of Assessment of Effects

Effects on water quality and ecosystem values

29. The applicant has advised that consultation with Department of Conservation (DOC) staff has occurred, including walking the proposed pipeline route, although results of that consultation have not been provided. Disturbance of indigenous vegetation communities during works could have an adverse effect on those communities, which may be avoided, remedied or mitigated by identifying the locations of those vegetation communities prior to works. Works also have the potential to disturb nesting birds. Relocating away from significant indigenous vegetation, undertaking works outside of nesting season for indigenous bird species, and working as far as

possible from established tracks on the property will minimise disturbance to native flora and fauna.

30. Regarding works proposed for all the applications, the applicant has identified the need to wash equipment off-site, prior to works within the beds of the lake, rivers and streams.
31. In summary, there are potential adverse effects on ecosystems that have been identified by the applicant, which require mitigation. Possible mitigation measures have been noted in the above paragraphs, which have are included as recommended conditions. With mitigation, I expect effects of the activity on ecosystems to be no more than minor.

Effects on amenity values

32. I note that the proposed pipeline route passes through an area that can be considered of moderately high natural character, as such, effects of the activity on landscape amenity values will be reduced by burying the pipeline, as proposed.
33. While the applicant is proposing to bury the pipeline within the beds of ephemeral streams at four crossing points, it is not clear that the pipeline will be entirely buried along its length, or adjacent to the stream crossing points, as the applicant has suggested the pipeline may be over land (using pipe anchors) in some places, depending on the lay of the land.
34. Effects on landscape and amenity values are expected to be minor where the pipeline is buried. A condition is recommended specifying that the pipeline be buried. I note that the applicant may wish to propose alternative mitigation.

Conclusion

35. With regard to s104(1)(a), the actual and potential effects of the proposed activity have been discussed above. For this application, I am satisfied that the actual and potential effects of the proposed activity will be minor, subject to mitigating conditions.

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

Regional Policy Statement (RPS)

36. Under Section 104(1)(b)(iii) of the RMA, the consent authority shall have regard to any relevant regional policy statement. The Canterbury Regional Policy Statement has been operative since 26 June 1998.
37. Of significance to these applications is Chapter 10, which relates to the management of the beds of lakes and rivers and their margins. Objective 1 provides for protection and enhancement of natural character and significant habitats of indigenous flora and fauna. Policy 1 requires identification of areas of natural character and significant habitats of indigenous flora and fauna, and Policy 3 requires that indigenous riparian vegetation be retained to enhance conservation values, which are matters that have not been fully addressed by the applicant in information provided to date.

Proposed Natural Resources Regional Plan (PNRRP)

38. The objectives and policies of the PNRRP that are relevant to each potential adverse effect have been identified in the introductory s42 report.

39. Of particular relevance to this application is Objective BLR1, which seeks to ensure that the activity does not restrict flood carrying capacity; erode the bed or banks of rivers, result in an increase in undesirable or pest plant infestation, adversely effect indigenous habitats and species or natural character. Objective BLR2 further seeks to ensure that the habitats of breeding birds and indigenous fauna are not disrupted or damaged by human activity. I am satisfied that these objectives will be met in relation to the proposed activity as a result of mitigation identified.

Part II Purpose and Principles

Purpose of the RMA (s5)

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

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

41. Section 5(2) defines the meaning of “sustainable management”, which is to manage resources in a manner that provides for the social, economic and cultural wellbeing of communities while protecting the life-supporting capacity of the environment for the needs of future generations. This section also states that this should be achieved by “avoiding, remedying or mitigating” the adverse effects of activities.
42. The proposal will allow the development of land to occur, which may provide for the economic and social well-being of the community. The applicant has proposed measures to “avoid, remedy or mitigate” the potential impacts on ecosystems and natural character, as required in Section 5(2)(c), and further mitigation has been identified.

Matters of National Importance (s6)

43. Sub-sections (a), (c) and (e) of Section 6 of the RMA are relevant to this application. The proposal may adversely affect natural character, and habitats of indigenous vegetation and fauna, which may be significant, but their status cannot be determined without further assessment by the applicant. Effects on indigenous species and natural character may impact on the relationship of Maori to their culture and traditions.

Other Matters (Section 7)

44. 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.
45. Section (d) refers to intrinsic values of ecosystems, which is relevant to sites of indigenous vegetation, bird nesting sites, and other species which may be disturbed during construction, or permanently displaced. Mitigation can address this matter.

Principles of the Treaty of Waitangi (s8)

100. Section 8 of the RMA requires the consent authority to take into account the principles of the Treaty of Waitangi. The site lies within the rohe of Te Runanga o Arowhenua and Te Runanga o Waihao. Te Runanga o Ngai Tahu have not submitted on this application. There is no record of consultation with runanga, although the applicant indicated an intention to consult when the application was lodged.

RECOMMENDATION

Grant or Refuse

46. Section 104B applies to any application which is a discretionary or non-complying activity and states that the consent authority may grant or refuse the application and may impose conditions under s108.
47. The applicant proposes to construct a buried pipeline from Tekapo Stilling Basin to the boundary of irrigation areas of Simons Pass Station, Simons Hill Station, Glentanner Station and Maryburn Station, and has proposed some mitigation with respect to crossing of ephemeral streams. Additional mitigation measures have been identified to address effects on indigenous habitats and species at the stream crossing points, and effects on landscape and amenity values.
48. In light of the above, I am satisfied that the application can be granted, subject to conditions.

RECOMMENDED CONDITIONS

49. Comments on the mitigation proposed by the applicant are provided earlier in this report.
50. If the Commissioners decide to grant this application, a list of conditions that are usually included in a permit to disturb the bed and banks of a waterway, and explanation for their inclusion, are provided in Appendix 6 of the introductory s42A report. A list of conditions for this application is included below, which are considered to adequately mitigate adverse effects on indigenous habitats and species, and landscape and amenity values. The italicised conditions are shorthand, with the full condition listed against the unique identifier in Report 1, Appendix 6.

CRC062871 – Ephemeral stream crossings

Scope

LU01

1. Works in the bed and banks of ephemeral streams shall be limited to installation, maintenance and operation of a buried irrigation supply pipeline, including:
 - a) installation of a 1200mm diameter pipe within the bed of the ephemeral stream at the first crossing point; and
 - b) installation of a 300mm diameter pipe within the bed of ephemeral streams at the second, third and fourth crossing points.

Location

2.
 - a) Works described in 1(a) above shall only be carried out within the bed and banks of the ephemeral stream at the first crossing point between map references NZMS 260 H38:878-657 and H38:879-657.
 - b) Works described in 1(b) above shall only be carried out within the bed and banks of ephemeral streams at the second crossing point between map references NZMS 260 H38:845-641 and H38:846-641, the third crossing point between map references NZMS 260 H38:848-642 and H38:849-642, and the fourth crossing point between map references NZMS 260 H38:861-643 and H38:862-643.

Prior to works

3. *LU08 Consent given to all on site*
4. The Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager shall be notified not less than 48 hours prior to the commencement of works.

Works/Construction

5. There shall be no stockpiling of materials within the bed or banks of ephemeral streams.
6. *LU16 Out of flowing water*
7. *LU21 Storage of fuel*
8. Machinery shall be free of plants and plant seeds prior to arrival at the works site, and prior to use within the bed of ephemeral streams.
9. Habitats and communities of significant indigenous flora, including threatened species, present within the site of works shall be identified prior to commencement of works, and all practicable measures shall be undertaken to avoid effects on species identified.
10. Works shall occur, as far as practicable, from established access roads and tracks, to minimise disturbance of flora and fauna present within, and adjacent to, the site of works.
11. *LU23 Minimise adverse effects on various values*
12. *LU011 No erosion of bed and banks – ephemeral streams*
13. Works shall not occur when birds are nesting or rearing their young within 100 metres of the site of works.

Accidental Discovery Protocol

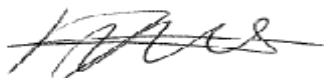
14. *LU09 Arowhenua Runanga and Waihao Runanga*

Upon Completion

15. *LU27 Remove spoil and waste material*
16. Upon completion of works the sites shall be restored to their original condition, as far as is practicable, including, but not limited to, levelling the excavated area to the level of the surrounding stream bed.
17. In the event that works cause damage to stream banks, remedial works shall be undertaken to restore bank stability.

Administration

18. *AD05 Review*
19. *AD06 Lapse*



Signed: _____

Date: 28 August 2009

Maria Bartlett
Consents Investigating Officer

REFERENCES

Canterbury Regional council 2004. Proposed Natural Resources Regional Plan – Chapter 6: Beds and margins of Lakes and Rivers

Canterbury Regional Council 1998. Regional Policy Statement. Report No R98/4. ISBN 1-86937-337-5.

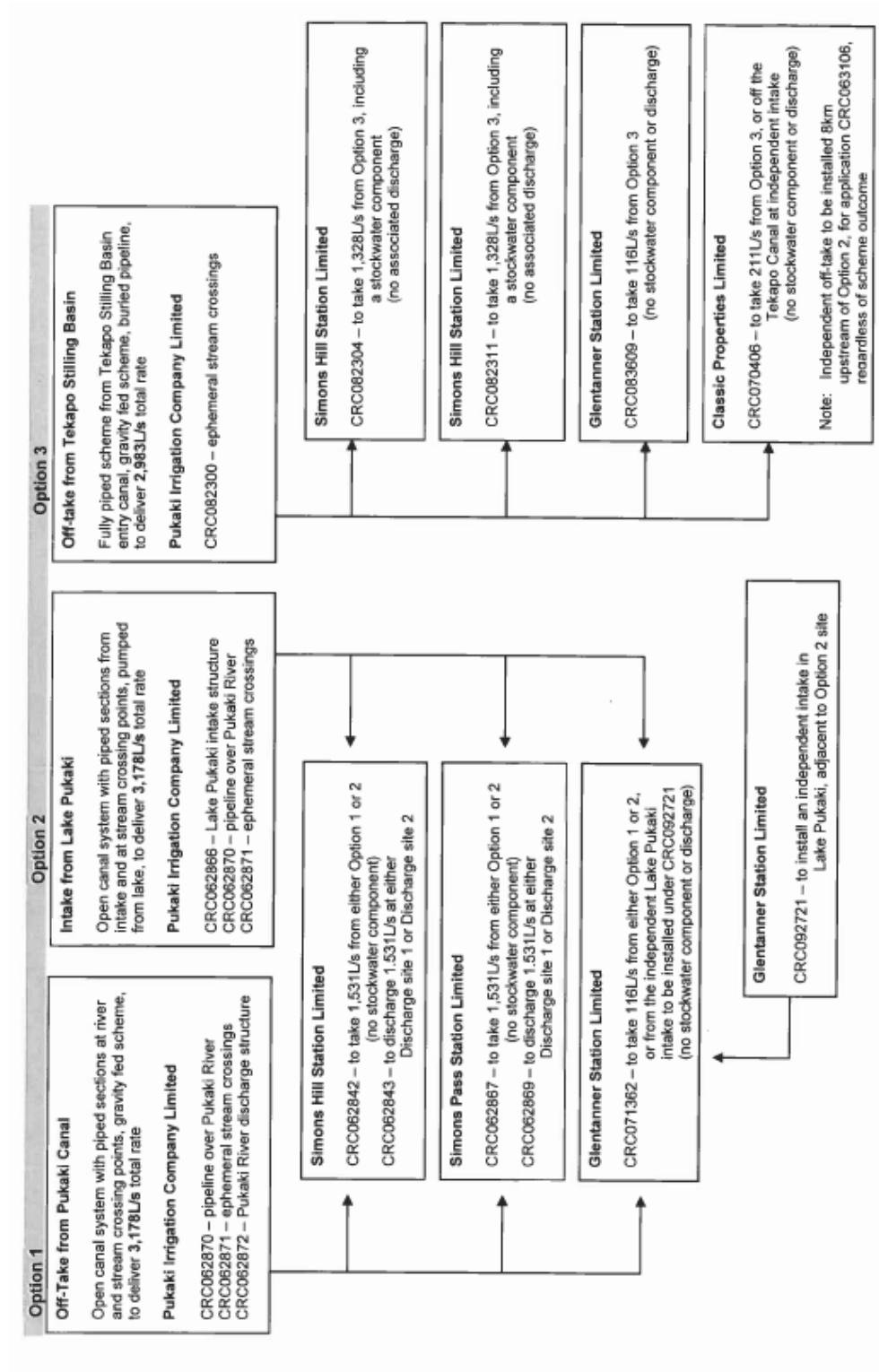
Canterbury Regional Council 1991. Transitional Regional Plan. October 1991.

Department of Conservation, Conservation Resources Report – Simons Pass, prepared for Land Information New Zealand (May 2008)

The Resource Management Act 1991. Consolidated version including the Resource Management Amendment Act 1995. August 2005.

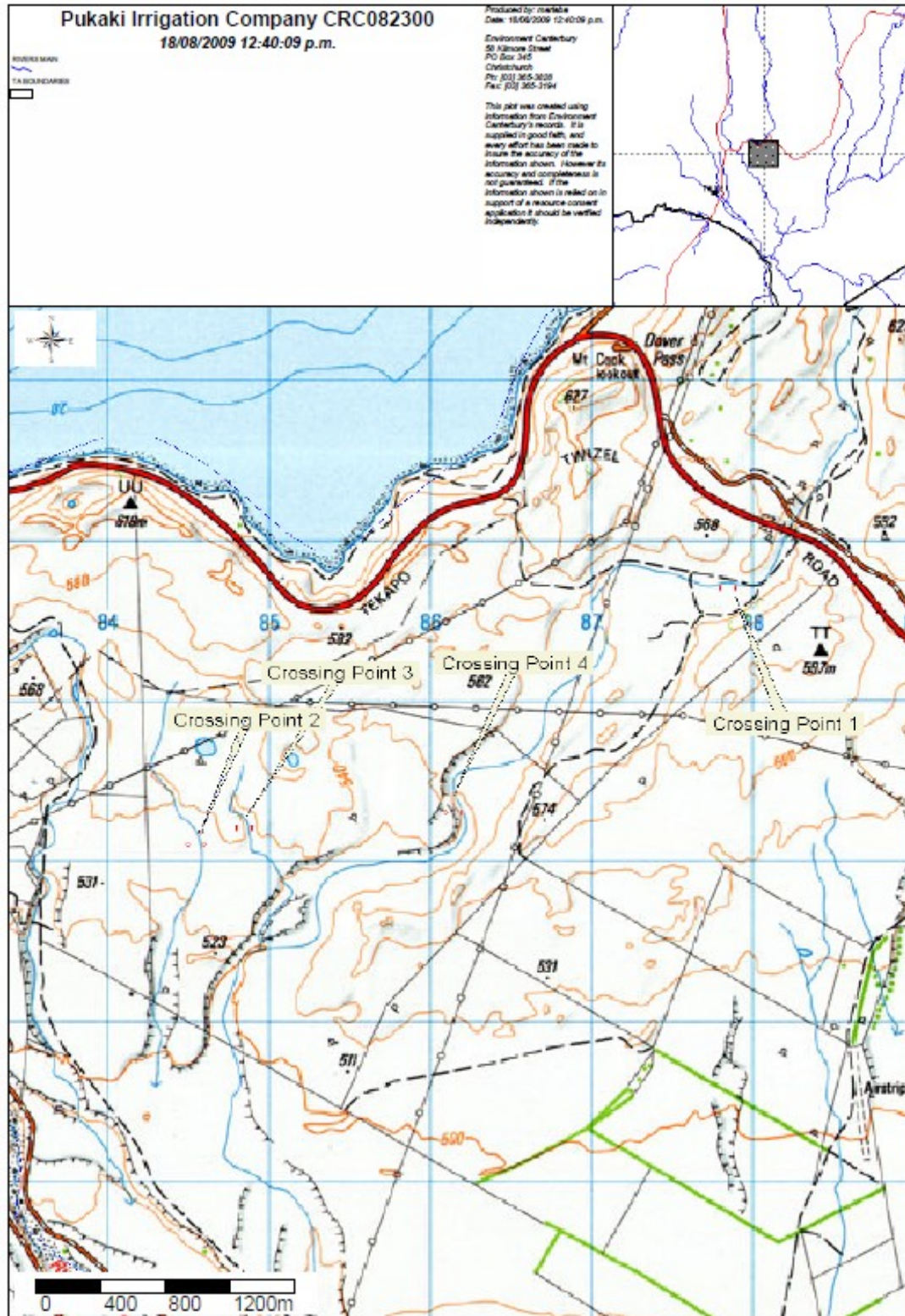
ATTACHMENT ONE: PUKAKI IRRIGATION SCHEME

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

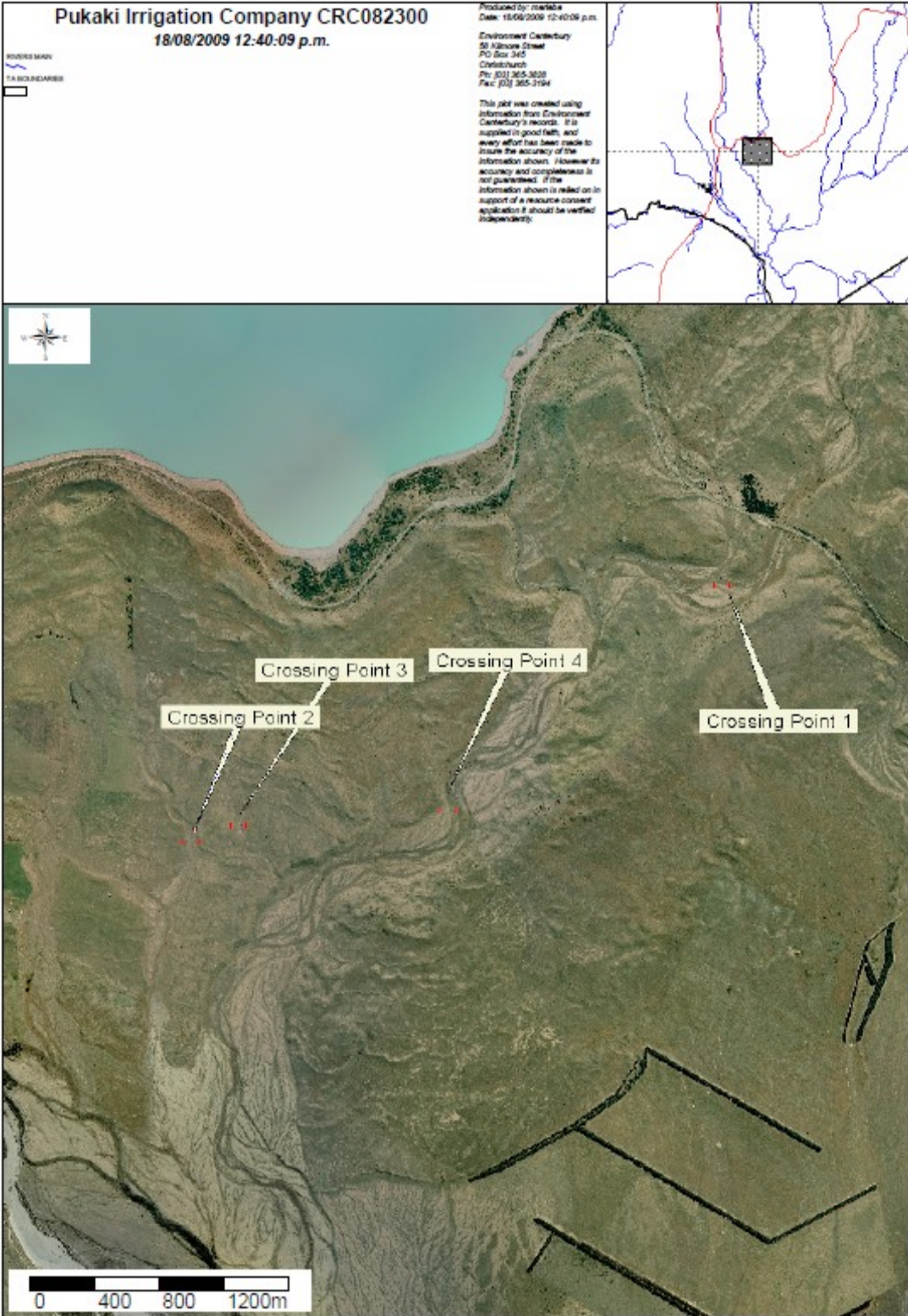


ATTACHMENT TWO – LOCATION MAPS

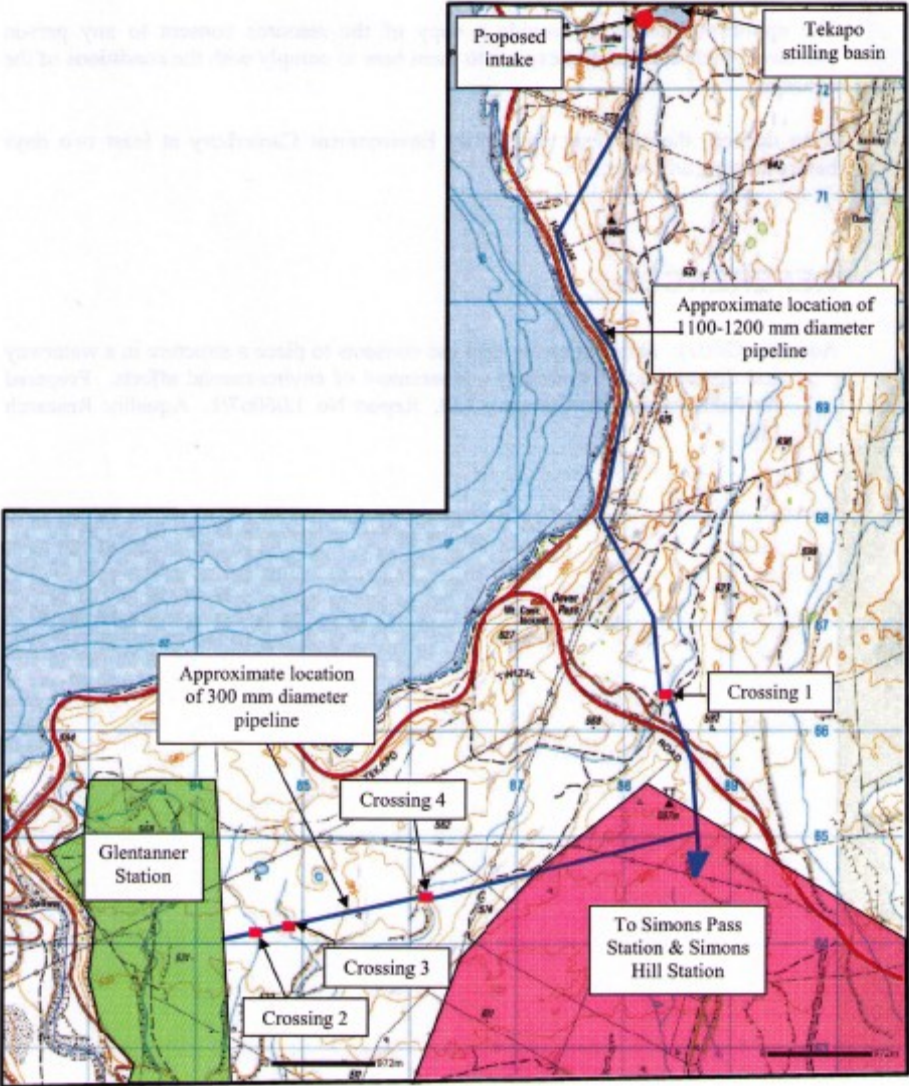
Topographic map showing ephemeral stream crossings points



Aerial photographic view showing ephemeral stream crossings points.



Irrigation supply pipeline route, as originally shown in AEE



Irrigation supply pipeline route, as supplied by the applicant on 21 June 2009.



ATTACHMENT TWO – PHOTOS OF SITE LOCATIONS

Crossing Point 1

Photographs of revised crossing point, supplied by the applicant on 26 June 2009.



Crossing Point 2

Photographs supplied by the applicant on 14 April 2008.



Photo 3: Stream crossing 2– Stream bed estimated to be 4 m wide



Photo 4: Stream crossing 2

Crossing Point 3

Photographs supplied by the applicant on 14 April 2008.



Photo 5: Stream crossing 3– Stream bed estimated to be 22 m wide



Photo 6: Stream crossing 3

Crossing Point 4

Photographs supplied by the applicant on 14 April 2008.



Photo 7: Stream crossing 4 – Stream bed estimated to be 5 m wide



Photo 8: Stream crossing 4