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Assessment of Effects

Cultural effects

An assessment of impacts on Ngai Tahu values was prepared for the original AEEs. No issues specifically relating to the shorter tunnel route were discussed, however, general comments about the project area are made. The proposed longer tunnel does not appear to impact on any Ngai Tahu values to any greater extent than that already covered in the original cultural impact assessment.

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7.1 Proposed Conditions

7.1.1 ECan consents

Land use consent for excavation under the Hawkins River and tributaries

- 1) This consent is subject to the conditions listed in Schedule 1: General Conditions.

Land use consent for excavation over unconfined or semi-confined aquifers

- 1) This consent is subject to the conditions listed in Schedule 1: General Conditions.
- 2) Works shall be confined to the area shown on the accompanying plan (Figure 2-1).
- 3) No hazardous materials shall enter groundwater.

Land use consent for storage of diesel to power plant and facilities during construction

- 1) This consent is subject to the conditions listed in Schedule 1: General Conditions.
- 2) The volume of the storage tank shall not exceed 10,000 litres.
- 3) The containment system surrounding the storage tank shall at all times have an available capacity of at least 12,000 litres.
- 4) The containment systems surrounding the storage tank shall be impermeable to prevent diesel leakage.
- 5) Design plans of the storage tank and bunded facility shall be provided to the Canterbury Regional Council prior to works commencing.

Water permit for dewatering along sections of the tunnel route during construction.

- 1) This consent is subject to the conditions listed in Schedule 1: General Conditions.
- 2) Water shall only be taken for the purposes of dewatering required to facilitate construction of the tunnel
- 3) Dewatering water shall not cause adverse effects on surrounding property or infrastructure.
- 4) The consent holder shall submit to the Canterbury Regional Council RMA Compliance and Enforcement Manager at least one month prior to the exercise of this consent, a Dewatering Management Plan outlining the construction and management practices and procedures to be adopted in order that compliance with the conditions of this consent can be achieved and the effects of the dewatering activities are minimised to the greatest extent practicable. The plan shall include, but not necessarily be limited to:
 - (a) The extent of the construction activities in relation to the areas where dewatering will be required.
 - (b) The types of dewatering methods to be adopted and details of where water will be directed and disposed of.
 - (c) A construction management programme including timetable, sequence of events and duration.
 - (d) The mitigation measures to be adopted to minimise the effects of dewatering on surrounding property and infrastructure.

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- (e) Contact details for the person in charge of the site works.
- (f) The consent holder may at any time, submit to the Canterbury Regional Council, an amended Dewatering Management Plan for the purposes of improving the efficiency and or quality of the dewatering or to remove or reduce an adverse environmental effect.

Discharge permit for the operation of a diesel generator during construction

- 1) This consent is subject to the conditions listed in Schedule 1: General Conditions.
- 2) The discharge to air shall occur via a chimney stack above the ridge line of the generator housing.
- 3) The discharge shall be directed vertically into air and shall not be impeded by any obstruction above the stack which decreases the vertical efflux velocity below that which would occur in the absence of such an obstruction.
- 4) The concentration of total suspended particulate in combustion gas discharged from the emission stacks, when measured in accordance with the requirements listed in Schedule AQL6 of the Proposed Canterbury Natural Resources Regional Plan, shall not exceed 500 milligrams per cubic metre of air adjusted to 0 Celsius, dry gas basis, 101.3 kilopascals, and 8 % oxygen or 12 % carbon dioxide.
- 5) The sulphur content of the fuel burnt shall not exceed 2 % by weight.

Discharge permit to discharge contaminants, principally sediment, and water to the Waianiwiwa River during construction of the tunnel

- 1) This consent is subject to the conditions listed in Schedule 1: General Conditions.
- 2) The discharge shall only be water and contaminants (principally suspended solids) produced from the tunnel and related facilities and reasonably necessary to facilitate the construction of the tunnel and related facilities.
- 3) The discharge shall be treated to an appropriate standard prior to discharge to the Waianiwiwa River, including through the use of settling pond(s).

Schedule 1: General Conditions

- 1) All works shall be undertaken in general accordance with the application documents and evidence presented except as modified by specific conditions.
- 2) All practicable measures shall be undertaken to minimise adverse effects on property amenity values, wildlife, vegetation and ecological values. This shall include but not be limited to spillage or discharge of hazardous substances into watercourses, stormwater discharges from construction sites, and prevention of contamination of land or groundwater resources. Particular regard shall be given to avoiding disturbance of bird life, waterfowl or their nests, spawning fish and redds, and the stranding of fish in pools or river braids.
- 3) The consent holder shall submit to the Canterbury Regional Council, attention RMA Compliance and Enforcement Manager, at least one month prior to the commencement of works, a Construction Management Plan outlining the construction activities and all practices and procedures to be adopted in order that compliance with the conditions of this consent can be achieved and the effects of construction activities are minimised to the greatest extent practicable. The plan shall include, but not necessarily be limited to:
 - a) The extent of the construction activities in terms of area.
 - b) The types of construction methods to be adopted.

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- c) A construction programme including timetable, sequence of events and duration.
 - d) Details of all necessary permissions required under other legislation (eg Historic Places Trust, Reserves Act) that have been obtained in relation to the works.
 - e) The mitigation measures to be adopted, including but not limited to sediment control, vegetation disturbance, dust, noise, odour, glare and the control of stormwater.
 - f) An assessment of the risks associated with the construction activities and methods adopted to minimise them.
 - g) Details concerning the storage and use of hazardous chemicals (including fuels and oils) stored or used at sites of work and provisions for refuelling and maintenance to be carried out.
 - h) Spill Contingency Plan.
 - i) Maintenance of the construction sites in a clean and tidy state and for the recovery and removal of debris.
 - j) Contact details for person in charge of the site works.
 - k) Discovery protocol for koiwi, taonga or artefact materials.
 - l) Emergency procedures.
 - m) Construction site rehabilitation plans.
- 4) The consent holder may, at any time, submit to the consent authority, an amended Construction Management Plan provided it is for the purpose of improving the efficiency and/or quality of the construction works, or to remove or reduce an adverse environmental effect.
 - 5) The consent holder shall notify the consent authorities in writing of the proposed date of commencement of the construction works, at least one month prior to the start date of the works.
 - 6) Within two months of the completion of the construction works, the consent holder shall supply to the consent authority a complete set of "as-built" plans confirming the location of the works.
 - 7) The consent holder shall within two months of completion of the construction works, issue a notice to the consent authority certifying that all construction debris or other materials from the construction works, that may pose a hazard to public safety, fishing or recreational activities, has been removed.
 - 8) The consent holder shall maintain and keep a complaints register for all aspects of all operations in relation to construction activities. The register shall detail the date, time and type of complaint, cause of the complaint, and action taken by the consent holder in response to the complaint. The register shall be available to the consent authority at all reasonable times.
 - 9) In the event of any disturbance of koiwi tangata (human bones) or taonga (treasured artefacts) the consent holder shall immediately
 - a) advise the Canterbury Regional Council of the disturbance;
 - b) advise the appropriate Runanga, or their representative, of the disturbance.
 - c) cease earthmoving operations in the affected area until the area containing the koiwi tangata or taonga has been clearly demarcated, and kaumatua and archaeologists have certified that it is appropriate for earthmoving to recommence.
 - 10) The Canterbury Regional Council may in the last five working days in June and December during the first five years from the date of issue of this consent, or until the completion of construction works and thereafter annually on the last five working days of June each year serve notice of its intention to review the conditions of this consent for the purpose of:

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- a) dealing with any adverse effects on the environment which may arise from the exercise of this consent;
 - b) ensuring the adequacy of the monitoring undertaken pursuant to this consent;
 - c) ensuring the adequacy of sampling and/or monitoring programmes;
 - d) dealing with any adverse effects or other issue identified in any report submitted as a condition of this consent.
- 11) Charges, set in accordance with section 36 of the Resource Management Act 1991, shall be paid to the Regional Council for the carrying out of its functions in relation to the administration, monitoring and supervision of resource consents and for the carrying out of its functions under section 35 of the Act.

7.1.2 SDC designation

Mitigation measures are outlined in full in Annexure H of the original Notice of Requirement lodged in November 2006.

7.2 Management Plans

Prior to construction, management plans will be prepared covering the following topics:

- Land rehabilitation
- Significant indigenous vegetation
- Remediation
- Hazardous substances
- Heritage
- Dust
- Noise
- Traffic
- Accident Discovery Protocol
- Health and safety
- Subsidence management and monitoring

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8.1 Statutory Assessment Overview

As noted in Section 1, this AEE technically supports new resource consent applications to ECan and a notice of requirement to SDC. The relevant statutory requirements are discussed in Sections 8.3 and 8.4 respectively. The Resource Management Act 1991 is firstly discussed in Section 8.2.

8.2 Resource Management Act 1991

8.2.1 Part 2 – Purpose and Principles

Section 5

Section 5 of the RMA contains the purpose of the Act:

5. Purpose

- (1) *The purpose of this Act is to promote the sustainable management of natural and physical resources.*
- (2) *In this Act, “sustainable management” means 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 wellbeing 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.*

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Section 6 of the RMA contains matters of national importance, to be recognised and provided for in achieving the purpose of the Act:

6. Matters of national importance

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall recognise and provide for the following matters of national importance:

- (a) *The preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development:*
- (b) *The protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development:*
- (c) *The protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna:*
- (d) *The maintenance and enhancement of public access to and along the coastal marine area, lakes, and rivers:*
- (e) *The relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga.*
- (f) *The protection of historic heritage from inappropriate subdivision, use, and development.*
- (g) *The protection of recognised customary activities.*

Section 7

Section 7 of the RMA contains other matters which shall be given particular regard to in achieving the purpose of the Act:

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7. Other matters

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall have particular regard to –

- (a) *kaitiakitanga:*
 - (aa) *the ethic of stewardship:*
 - (b) *the efficient use and development of natural and physical resources:*
 - (ba) *the efficiency of the end use of energy:*
 - (c) *the maintenance and enhancement of amenity values:*
 - (d) *intrinsic values of ecosystems:*
 - (e) *repealed.*
 - (f) *maintenance and enhancement of the quality of the environment:*
 - (g) *any finite characteristics of natural and physical resources:*
 - (h) *the protection of the habitat of trout and salmon:*
 - (i) *the effects of climate change:*
- (j) *the benefits to be derived from the use and development of renewable energy*

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Section 8 of the RMA states the role of the Treaty of Waitangi in achieving the purpose of the Act:

8. Treaty of Waitangi

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).

Consistency with Part II

The original AEEs note that the Scheme has the potential to deliver social and economic benefits to the community, while sustaining the water and land resources, maintaining their life-supporting capacity, and avoiding, remedying or mitigating adverse effects on the environment. Through careful design, construction and operation methods, significant environmental values within the project area can be maintained and in many instances enhanced.

The proposed longer tunnel will avoid a number of actual and potential adverse environmental effects noted in the original AEEs whilst delivering the same social and economic benefits. For this reason the conclusions in the original AEE remain unchanged, that is, that subject to appropriate design and mitigation, the Scheme and proposed tunnel is considered consistent with the purpose and principles of the RMA.

8.3 Environment Canterbury

8.3.1 Transitional Regional Plan (TRP)

Rule 9 of the Bylaw No 2 Underground Water states that there shall be no excavation to a depth below ground level exceeding 8 metres. Non-compliance with this rule is a discretionary activity.

Storage of diesel in volumes exceeding 2,500 litres is a restricted discretionary activity under Bylaw No. 2.

There are no relevant objectives and policies.

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8.3.2 Proposed Natural Resources Regional Plan

Chapter 3 – Air Quality

Rule AQL26 states that the discharge of contaminants into air from the burning, outside the Christchurch Clean Air Zones 1 and 2, of diesel in any external combustion equipment having a net combined heat output capacity within one property of greater than 2 megawatts and less than or equal to 5 megawatts; is a controlled activity, subject to:

- 1) *The discharge into air shall occur via a chimney stack at a height of at least 7 metres above ground level and at least 3 metres above the ridge line of the roof of any building, land or other substantial structure within a distance of five times the height of that building, land or structure.*
- 2) *The discharge into air from internal combustion equipment shall occur via a chimney stack above the ridge line of the roof of any building, land or other substantial structure within a radius, from the stack, of 5 times the stack height.*
- 3) *The discharge shall be directed vertically into air and shall not be impeded by any obstruction above the stack which decreases the vertical efflux velocity, below that which would occur in the absence of such obstruction.*
- 4) *Generators shall only be used for emergency electricity supply, and shall not be used for network load shedding during times of peak electricity demand.*
- 5) *The concentration of total suspended particulate in combustion gas discharged from all emission stacks, when measured according to the requirements described in **Schedule AQL6**, shall not exceed 500 milligrams per cubic metre of air adjusted to 0 °Celsius, dry gas basis, 101.3 kilopascals and 8% oxygen or 12% carbon dioxide.*
- 6) *The sulphur content of the fuel to be burned shall not exceed 2% by weight.*

Operation of a 3 MW diesel generator will not comply with Condition 4 above and is therefore a discretionary activity under Rule AQL27.

Chapter 4 – Water Quality

Rule WQL40 is concerned with excavation of land over an unconfined or semi-confined aquifer. Whilst it is unclear whether the majority of the tunnel route, being in or under an unconfined or semi-confined aquifer, is captured by this rule, it at least applies at the portal areas.

Rule WQL40 states:

Except where the use of land is a prohibited activity under Rule WQL63, the use of land to excavate land:

- (a) *over an unconfined or semi-confined aquifer:*
 - (i) *where the depth of excavation;*
 - (1) *exceeds five metres; or*
 - (2) *is deeper than the highest groundwater level which can reasonably be expected to occur at the site, based upon the relevant and available groundwater data; and*
 - (3) *where the volume of material excavated exceeds 100 cubic metres within any consecutive 12 month period; or*
 - (b) *within the Coastal Confined Gravel Aquifer System, where there is less than one metre of undisturbed sediment between the base of the excavation and Aquifer 1; is –*
 - (c) *a restricted discretionary activity if such use complies with all of the conditions of this Rule;*
 - (d) *a non-complying activity if such use does not comply with any one or more of the conditions of this Rule, in which case a resource consent under Rule WQL 62 is required.*

For the purposes of this rule, excavation of land does not include the drilling or disturbance of land to construct or maintain a bore.

In order to be a restricted activity the following conditions must be met:

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1. The use of land shall not occur within:
 - (a) 100 metres of the edge of any permanently or intermittently flowing river, lake; or
 - (b) 100 metres of the boundary of a wetland:
 - (i) listed in Schedule WTL1: Moderate and higher significance wetlands; or
 - (ii) any other wetland unless the taking, use, damming or diversion of water is permitted under Rule WTL2 or Rule WTL3; or
 - (c) a Community Drinking Water Supply Protection Zone for a well listed in Schedule WQL2, or
 - (d) the Christchurch Groundwater Recharge Zone, excluding the land in Zone 1C, as shown on the Map Volume Part 1- Planning Maps.

The above will be complied with and therefore the activity is a restricted discretionary activity.

Diesel may be stored in above ground container at the site – this is a permitted activity under Rule WQL43, subject to conditions. It is expected these conditions can be met.

The discharge of contaminants and water from the tunnel (and subsequent treatment systems) to the Waianiwiwa River may not meet the permitted activity conditions in Rule WQL1 or the discretionary activity conditions under Rule WQL56. Therefore the discharge is non-complying under Rule WQL 60.

Chapter 5 – Water Quantity

Rule WQN 17 permits the taking of water from groundwater for site dewatering, subject to conditions:

1. The taking of water from groundwater for the purpose of dewatering of sites for carrying out excavation, construction and geotechnical testing, is a permitted activity provided the activity complies with the conditions in this rule.
2. Where any of conditions 1, 2, 3, or 4 are not complied with, the activity is a discretionary activity under Rule WQN18.

Conditions

1. The take shall continue only for the time required to carry out the work but not exceeding nine months.
2. The take shall not lower the groundwater level more than eight metres below the ground level of the site.
3. The take shall not cause ground subsidence.
4. The take shall not cause a wetland to be de-watered, except where this is permitted in accordance with Rule WTL2 or Rule WTL3.

Dewatering of the tunnel and portals will exceed 9 months and is therefore a discretionary activity under Rule WQN18.

Chapter 6 – Beds and margins of lakes and rivers

Rule BRL3 permits the excavation or drilling within and under river beds:

1. The excavating, drilling, tunnelling or disturbance (but not including excavation of materials for the erection, reconstruction, placement, use, alteration, extension, demolition or removal of a structure classified as a permitted activity by rule BLR1 or BLR2) in, on, over or under the bed of a lake or river, or
2. any depositing of excavated material on the bed associated with the undertaking of activities in (1) above (but not including excavation of materials for the erection, reconstruction, placement, use, alteration, extension, demolition or removal of a structure classified as a permitted activity by rule BLR1 or BLR2) in, on, over or under the bed of a lake or river, is:
 - (a) a permitted activity provided the activity complies with all the conditions of this rule;
 - (b) a permitted activity where condition (1) is not complied with, but the activity complies with all the conditions of Rule BLR6;
 - (c) a discretionary activity where condition (1) is not complied with, and the activity does not comply with the conditions in Rule BLR6, in which case the activity requires resource consent under rule BLR8; or
 - (d) a discretionary activity where any other condition is not complied with, in which case the activity requires resource consent under Rule BLR8.

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The proposal complies with all conditions under Rule BLR3, with the exception of:

2. *The activity shall not involve the disturbance or removal of any rocks with a diameter greater than 500 millimetres in any direction.*
8. *No part of the activity shall occur within surface water or at or below the water table.*

The proposal is therefore a discretionary activity under Rule BRL8

8.4 Selwyn District Council

A designation is a tool available to Requiring Authorities under Section 168 of the RMA. It allows for the provision of works and projects in District Plans, where the activity is generally not a permitted activity. In this case, construction of the tunnel is likely to be considered a discretionary or non-complying activity in the Proposed Selwyn District Plan: Rural Volume, under the following rules:

- Rule 1 – Earthworks
- Rule VI – Hazardous Substances
- Rule IX - Activities

By identifying the proposed tunnel route in the District Plans, the wider public and future landowners would be kept informed of CPWL's intention to use the land for a designated purpose.

The designation requirement applied for with respect to the tunnel, as shown on the plan in Appendix A of this AEE, covers the entirety of the ~10 km route. The Waianiwaniwa portal and construction staging areas will be located in the requirement for designation already lodged with SDC. The Waimakariri portal will also be located in the existing designation for the canal route.

As the tunnel designation will pass under an existing designations held by Transit New Zealand, CPWL will need to gain their written permission prior to works commencing. Given that the underground tunnel would not interfere with activities on the surface, it is not anticipated that gaining this permissions will be problematic.