16 September 2025

[redacted]

[redacted] Fast-track Applications

Environmental Protection Authority

info@fasttrack.govt.nz

Environment Canterbury Regional Council
Kaunihera Taiao ki Waitaha

Customer Services
P. 03 353 9007 or 0800 324 636

PO Box 345
Christchurch 8140

P. 03 365 3828
F. 03 365 3194
E. ecinfo@ecan.govt.nz

www.ecan.govt.nz

Dear [redacted]

Thank you for your letter, dated 2 September 2025, regarding the Haldon Solar application from Lodestone Energy Limited (Lodestone / the Applicant).

Please find below the response from the Canterbury Regional Council on considerations of the completeness of the Applicant's Substantive Application under the Fast-track Approvals Act 2024 (the Act / FTAA).

Consideration under s30 of the Act.
Section 8.2 of the Substantive Application notes that Canterbury Regional Council supplied a s30 response on 14 April 2025.

Canterbury Regional Council sent an updated s30 letter to the Applicant on 17 July 2025, which is provided as Appendix 1 to this letter. Canterbury Regional Council can confirm that, as of 15 September 2025, the information within the 17 July 2025 s30 letter is still current, and that there are no existing resource consents of the kind described in s30.

The substantive application includes applications for the following approvals under the Resource Management Act 1991 (RMA) that Canterbury Regional Council is the relevant consent authority for: a resource consent that would otherwise be applied for under the RMA (section 42(4)(a) of the FTAA).

Based on the information provided in the Substantive Application (and its appendices), Canterbury Regional Council considers that the Canterbury Land and Water Regional Plan (LWRP) would apply.

The Waitaki Catchment Water Allocation Regional Plan (WCWA) also applies to the site of the proposal, though there are no rules or consent requirements relevant for the activities identified by the Applicant in the Substantive Application.

Consents under the RMA that would be administered by Canterbury Regional Council:

a. Section 9 Land Use Consent
    a. To undertake earthworks over an aquifer – LWRP Rule 5.176
    b. Requested duration: 10 years
b. Section 15 Discharge Permit
    a. To discharge construction-phase stormwater to land – LWRP Rule 5.94B
    b. Requested duration: 10 years
c. Section 15 Discharge Permit
    a. To discharge operational stormwater to land – LWRP Rule 5.97
    b. Requested duration: 35 years

Canterbury Regional Councill considers that, based on our understanding of the proposal, the relevant planning documents identified by the Applicant in the Assessment of Environmental Effects (AEE) are correct, and that the Applicant has assessed their proposal against the relevant Plans with regards to regional consenting.

It is noted that the Applicant's proposed conditions for their Mackenzie District Council consents includes "*provision… of an onsite firefighting water supply*".

As noted above, the proposal includes the provision of water for firefighting use (Proposed Conditions for Mackenzie District Council – Condition 35), though no details on the source of that water are provided. The Applicant's consultant provided further comment noting that the risk of fire at the site is low, and that Fire and Emergency New could be self-sufficient or rely on RMA s14(3)(e) to access water sources, including Lake Benmore, for firefighting (See Appendix 10 attached to this letter).

Alternatively, the Applicant could apply for resource consent to take water under the WCWA. Such an application would not trigger FTAA s30, as multiple water takes may occur on a property concurrently, and any application by the Applicant would not be subject to RMA s124C.

So, while the applicant has not applied to take water for potential firefighting use, the applicant should clarify the proposed source of water. This is not considered to be a major issue that would be a barrier to accepting the Substantive Application.

Whether that substantive application made available to Canterbury Regional Council, meets the requirements of sections 42 and 43 of the Act and is provided in sufficient detail to satisfy the purpose for which it is required in accordance with section 44 of the Act.

Overall, Canterbury Regional Council considers the application **does not** meet the requirements of ss 42-43 of the Act. The main considerations for this determination are summarised below:

1. Insufficient consultation with relevant iwi authorities.
2. Contaminated Land assessments (PSI) not undertaken on site.
3. Ecological Assessments lack detail of potential ecological values at site.

The reasoning for this determination is outlined below, with comments from Canterbury Regional Council technical advisors summarised in Table 1 below.

Table 1. Canterbury Regional Council Technical Advice Summary				
Technical Team	**Technical expert considers all expected technical reports are provided**	**Technical expert has identified gaps in the provided technical reports** [*Consent Planner clarifying comments*]	**Technical expert considers the conditions are appropriate**	**Comments; Key Findings & Concerns** [*Consent Planner clarifying comments*]
Consent Planning	No – Further technical reports required as per advice below. All regional consents required have been applied for.	Clarification of firefighting water supply needed. Clarification of dewatering activity status needed.	Yes – Generally good scope and detail for conditions. See further comments from other technical advisors below.	Assessments against LWRP generally good. Agree that LWPR is supportive of proposal in seeking to enable regionally significant infrastructure, which this proposal would be. The comments from Contaminated Land and Land Ecology advisors below indicate that further information is required to understand the potential effects of the proposal, as well as inform the mitigation, offsets, or compensation that would be appropriate to address those effects. As such, it is considered that further information is required to process this application.
Land Ecology - Appendix 2	No – While Ecological Assessment provided, lacking in some details. E.g., no survey of lizard or	Ecological Report lacking lizard and invertebrate survey. Required to establish appropriate mitigation.	Consider further compensation or offsets required to address effects, some of which are unavoidable: • Loss of potential bird	Overall, level of potential effects vary from very low to moderate. Solar farms not compatible with maintaining ecologically significant dryland values. Further mitigation, offsetting, or compensation should be offered given the unavoidable effects to unique ecology.

	invertebrates present at site. Given the significant ecological values of the area, these surveys would be required to inform the potential effects, including cumulative effects on the Mackenzie Basin.		feeding/breeding habitat • Cumulative effects on terrestrial biodiversity loss • Changes to site will favour exotic vegetation species and reduce the abundance of native dryland vegetation and potentially associated fauna	Note that site is shown as unconverted land, unlike other solar proposals (e.g., The Point – Far North Solar Farm, or Twizel Solar Project – Nova Energy).
Contaminated Land – Appendix 3	No – There is no Preliminary Site Investigation (PSI).		Proposed conditions are appropriate for the monitoring. Conditions should be included requiring: • PSI • Ensuring imported material meets clean fill definition • Trigger limits for monitored contaminants should be further specified.	No assessment of potential Hazardous Activities and Industries List (HAIL) sites [contaminated sites] across site. Applicant relies on Canterbury Regional Council's Listed Land Use Register, which shows the landfill HAIL site as outside the area of development, but the polygon for the HAIL site is indicative only. **[***It is noted that imagery from around the time the landfill was established seems to show roading much the same as currently on site. This would lessen the likelihood that the landfill crossed into the area proposed for development, as a road and fence currently separates the two areas.***]** Consent condition could require a PSI to ensure that any contaminated areas are identified. If

				further contamination identified, a DSI, remedial action plan, and site validation report may be required. All investigations must be undertaken by a suitably qualified and experienced practitioner in contaminated land.
Land Resources Science – Appendix 4	Yes – no further reports recommended.	N/A	Yes, overall. Soil monitoring of ECan Conditions 22-29 are very thorough, thought they could be improved by further specifying sections, sample number requirements. No mitigating contingency plans included in conditions if monitoring parameters are breached. Should require plan drafted before grant. Consider additional 6-month condition monitoring ground vegetation cover required.	Material removed as part of development should be kept on-site for remediation at site decommissioning, e.g., filling of pile holes if panel infrastructure removed.

Groundwater (Quantity & Quality) – Appendix 5	Yes – AEE provides a basic description of groundwater, but it lacks a specific discussion on the effects of the proposed activities on groundwater.	No onsite assessment of onsite groundwater levels. Desktop analysis only using CRC's existing wells, which are not located in optimal locations. No detailed Geotech assessment Dewatering may be required to lay cables. No onsite assessment of groundwater quality to establish baseline groundwater quality. The applicant classifies the **dewatering** as a permitted activity (Rule 5.119). **This is likely the cas**e, but there are a few areas that are not completely covered off. - Are the excavations outside the HAIL? - What is the expected dewatering rate given the sub-surface conditions?	Yes – Conditions address main concerns.	The applicant has mentioned that groundwater may be intercepted as cables are buried 2.5 m below ground level. Therefore, minor dewatering may be required. There is a lack of detail around the scale of the dewatering required. Operational stormwater will have stormwater soakage pits for associated buildings. There is no detail on the design to determine if they will intersect groundwater. Unsure if excavations are potentially over HAIL (landfill site) **[***See Contaminated Land comments above***]** No details on the expected contaminants in the operational stormwater discharge. Particularly near the substation and buildings. Galvanised steel piles will be installed from 1.5 to 3 m below ground level. Shallow groundwater can be as high as ground level. There is a long-term risk of zinc potentially leaching to groundwater from the galvanised steel piles. Any contaminants that find their way to groundwater are likely to flow to Lake Benmore. The risk would depend on the nature of the galvanised steel piles and the number. **[***Piling is a s9 land use matter for Mackenzie District Council***]**

		- Can the discharge meet LWRP TSS limits? - How close to Lake Benmore will the dewatering occur?		Maintenance schedule of the solar panels. Any cleaning detergents proposed? **[***Generally conditioned that any washdown be down with pure water only***]**
Planning – Appendix 6	Additional reports required: • Cultural Impact Assessment • Liquefaction Risk Assessment • Ecological management Plan	Gaps identified: • No consideration of cumulative effects of solar farm developments in the area – needs to be taken into account in landscape and transport assessments and when considering where workers will be accommodated. • Unlike the proposals for other solar arrays in the area, no plans have been provided for any ecological restoration at the site. Restoration and enhancement of indigenous biodiversity,	• Unlike the proposals for other solar arrays in the area, no plans have been provided for any ecological restoration at the site. Restoration and enhancement of indigenous biodiversity, particularly in the margins of the adjacent waterbodies, could be included as a consent condition. Such activities would give better consistency with RPS Chapter 9 objectives and policies. • Condition could be included requiring	**[***To preface this advice, Consents Planning would like to highlight that the consents required under Canterbury Regional Council plans relate to earthworks, construction-phase stormwater, and operational stormwater discharges. As such, only effects related to those activities require the applicant's assessment. The Planning advice below is more wholesome, and may be relevant for the applicant's territorial consents, and shortcomings identified in the below advice is disregarded in some cases when forming the overall conclusion on completeness relevant for Canterbury Regional Councils requirements***]** Further details are included in the CRPS Assessment, attached as Appendix 6 to this letter. The main points in the assessment are: • The project, as renewable energy infrastructure, is generally supported by the provisions of the CRPS. • The site is within the Outstanding Natural Landscape of the Mackenzie Basin. Further

		particularly in the margins of the adjacent waterbodies, would assist the project to comply with CRPS objectives and policies.	access to Lake Benmore.	assessment of cumulative effects of solar farms should be provided, as well as discussion of potential mitigation. • An old landfill has been identified close to the site. Further information on how potentially contaminated land will be managed is needed in order to determine compliance with the CRPS. • Further information is needed to determine how public and Ngāi Tahu access to and along the Tekapo River and Lake Benmore might be affected by the proposal. **[***Noting Statutory Acknowledgement to Ngāi Tahu with respect to Lake Benmore***]**.
Natural Hazards – Appendix 7	Yes – Flood modelling seems appropriate.	N/A	Yes – Freeboard levels over 450-year (substation) and 100-year flood events seems appropriate.	So long as there are no significant alterations to the swales or actions to impede the flow of water through these swales, no reason to think that the assessment is lacking or incomplete. Satisfied that the location is not high hazard and as a result have no objections to the proposal or mitigation methods proposed. Culverts for the roading would be appropriate where existing swales/flow paths exist to allow flood flows to continue to use existing overland flow paths.

Section 42 – Authorised person may lodge substantive application for approvals

Canterbury Regional Council considers that the Applicant has identified and applied for all relevant RMA consents under Canterbury Regional Council's plans, as outlined above.

Section 43 – Requirements for substantive application

Parts of this section where Canterbury Regional Council considers that kay information is lacking or could be clarified are highlighted below:

1. Cultural Assessments
    a. The application includes assessment against the Iwi Management Plan of Kati Huirapa, as well as the Waitaki Iwi Management Plan 2019.
    b. AECL highlighted that the assessments against the Kati Huirapa and Waitaki Iwi Management Plans are short and do not identify all relevant provisions.
    c. Planning recommended provision of a Cultural Impact Assessment.
    d. Consultation with relevant iwi authorities could have addressed the cultural matters, but this has not been undertaken in sufficient detail by the Applicant.
2. Contaminated Land information
    a. An historic landfill is identified in proximity to the site's north-western boundary.
    b. Canterbury Regional Council Contaminated Land staff consider that a Preliminary Site Investigation should be undertaken to clarify not only the extent of the existing landfill, but also across the site as a whole to identify any potentially contaminated material that may exist at the site. For a development of this size, a PSI is expected.
3. Land Ecology Assessment
    a. The Ecological Assessment provided with the application does not include a survey for lizards or invertebrates. Given the ecologically significant habitats at the site and area, these surveys should be provided to properly inform potential mitigations.
    b. Canterbury Regional Council Land Ecology has expressed concerns around the methodology used to identify ecological values at the site and the conclusions drawn around the level of potential effects, which are considered to be low-moderate.

Section 11 - Consultation requirements

Canterbury Regional Council considers that the Applicant **has not** undertaken adequate consultation per FTAA s11.

1. Consultation with Canterbury Regional Council

Canterbury Regional Council considers that the Applicant **has** undertaken adequate consultation with Canterbury Regional Council.

The Applicant undertook consultation with Canterbury Regional Council on several occasions between 6 November 2024 and the date of lodgement. This included providing draft technical assessments, the s30 letter noted above, and a pre-application meeting on 24 July 2025. Canterbury Regional Council provided advice after that meeting around appropriate conditions and assessments to include in the application. The minutes for that meeting are attached as Appendix 9 of this letter.

It is noted that Canterbury Regional Council offered to review the draft Substantive Application document prior to lodgement on several occasions, though the Applicant did not take up this offer.

The Applicant's consultant also provided a memorandum of further comments in response to concerns raised by Canterbury Regional Council around this 'Completeness Check' on 15 September 2025. That memorandum is attached as Appendix 10 of this letter.

2. Consultation with relevant iwi authorities, hapū, treaty settlement entities

Canterbury Regional Council considers that the applicant **has not** undertaken adequate consultation with relevant iwi authorities.

1. Te Rūnanga o Arowhenau and Aoraki Environmental Consultancy Ltd
    a. Canterbury Regional Council has received advice from Aoraki Environmental Consultancy Ltd (AECL), who provide cultural advice on behalf of Te Rūnanga o Arowhenau (Arowhenua).
    b. The record of consultation provided by AECL indicates varying degrees of consultation between December 2023 and the lodgement of the Substantive Application. This includes two occasions where AECL representatives visited the site (though it is unclear if the applicant met with AECL representatives), as well as provision of a draft Landscape Report to AECL. Apart from this, the consultation record seems to indicate that the applicant's consultation consists mostly of updates to AECL and other iwi entities (Ngāi Tahu, Aukaha).
    c. Notwithstanding, AECL considers that the consultation undertaken is **insufficient** to meet the requirements of Section 11.

    d. AECL notes that they were not aware of the Applicant's proposed Kaitiaki Working Group.
    e. The full advice from AECL can be viewed as Appendix 8 to this letter.
2. Te Rūnanga o Waihao and Te Rūnanga o Moeraki and Aukaha Limited
    a. Aukaha Limited (Aukaha) provide Canterbury Regional Council with cultural advice on behalf of Te Rūnanga o Waihao (Waiaho) and Te Rūnanga o Moeraki (Moeraki).
    b. Aukaha has advised Canterbury Regional Council that they had insufficient time to review the application material and comment on the completeness of the application.
    c. The Applicant's record of 'Aukaha Consultation' (Appendix 12 of the application documents) consists of a single email with Greg Carson from June 2024.
    d. Overall, it is not evident that the Applicant has undertaken sufficient consultation with Aukaha, Waihao, or Moeraki.

The consultant's additional memorandum of 15 September 2025 (attached as Appendix 10 of this letter) acknowledges these concerns. The consultant outlined the Kaitiaki Working Group proposed as a condition of consent, as well as a willingness from the applicant to continue addressing cultural concerns.

Notwithstanding, Canterbury Regional Council **does not** consider the Applicant's consultation with the relevant iwi authorities was undertaken in sufficient detail to satisfy the requirement of s44 FTAA.

Summary and Key Concerns

From Canterbury Regional Council's perspective, the information provided as part of the application is considered **incomplete**.

Canterbury Regional Council considers the application should not be accepted because:

1. Insufficient consultation has been undertaken with the relevant iwi authorities.
2. Further information around contaminated land, in the form of a Preliminary Site Investigation (PSI), is considered appropriate to inform necessary mitigations.
3. Further ecological assessment, including survey for lizard and invertebrates, as well as clarification of methodology to identify ecological values of the site is considered appropriate to inform potential effects of the development and suitable mitigations.

We trust that this information assists you determining the completeness of the application regarding the Haldon Solar Project from Lodestone Energy Ltd, under section 46(1) of the Act.

Please advise if you need any further clarification on any matters raised in this letter. We look forward to working with you further on this application if it is considered to meet section 46(1) of the Act.

Yours Sincerely,

Dr. Tim Davie

Acting Operations Director

List of Appendices:

- Appendix 1 – s30 letter 17/7/25
- Appendix 2 – Land Ecology Technical Advice
- Appendix 3 – Contaminated Land Technical Advice
- Appendix 4 – Land Resource Science Technical Advice
- Appendix 5 – Groundwater Technical Advice
- Appendix 6 – Planning Technical Advice
- Appendix 7 – Natural Hazards Technical Advice
- Appendix 8 – Aoraki Environmental Consultancy Ltd Advice
- Appendix 9 – Canterbury Regional Council Pre-Application
- Appendix 10 – Consultant Memorandum of Further Information

APPENDIX 1 – SECTION 30 LETTER 17 JULY 2025

17 July 2025

Environment Canterbury
Regional Council
Kaunihera Taiao ki Waitaha

Customer Services
P. 03 353 9007 or 0800 324 636

PO Box 345
Christchurch 8140

P. 03 365 3828
F. 03 365 3194
E. ecinfo@ecan.govt.nz

www.ecan.govt.nz

Brad Henderson
South Island Development Manager
Lodestone Energy
c/o [redacted]

Kia Ora Brad,

Section 30(3)(b) of the Fast Track Approvals Act 2024

Thank you for your email dated 16 July 2025 regarding Lodestone Energy Limited's proposed Haldon Solar Project.

We acknowledge that the proposal is listed under Schedule 2 of the Fast Track Approval Act 2024 (FTAA).

In accordance with section 30(3) of the FTAA, the Canterbury Regional Council (CRC) is required to:

> *...advise the authorised person—*
>
> *(a) of any existing resource consent to which section 124C(1)(c) or 165ZI of the Resource Management Act 1991 would apply if the approval were to be applied for as a resource consent under that Act; or*
>
> *(b) that there are no existing resource consents of that kind.*

Canterbury Regional Council can confirm that there are no existing resource consents as per section 30(3)(b) of the Fast Track Approvals Act.

CRC trust this clarification provides the necessary information for proceeding with the application under the FTAA. Should you require any further information or have additional queries, please do not hesitate to contact us.

Ngā mihi

Nardia Feehan

Principal Consents Planner

APPENDIX 2 – LAND ECOLOGY TECHNICAL ADVICE

From: Dr Jean Jack – Canterbury Regional Council Land Ecology: Team Leader

Fast Track Approvals Act 2024 (FTAA) Technical Advice

Date	14/9/2025
To	Reuben Herz-Edinger, Consents Planner
From	Jean Jack, Land Ecology Team Leader, Science
Project advice provided for	Lodestone Energy Limited – Haldon Solar Project - RMA261235
Documents referred to	Application, C25C/207069 – design and specifically section 3.13, 6.5 & 7.2 relating to ecology; - (the Application) Appendix 2, Draft Conditions for Ecan, C25C/207109 - (the Proposed Conditions) & MDC conditions under C25C/214331-8 Appendix 7, Ecological Assessment, C25C/207314 (the Ecology Report)

Executive summary/overview

1. The proposal and solar array design for which I have considered potential effects on ecology is described as:
    - A utility-scale solar farm at the 320 ha Haldon Station site in Mackenzie Country (**Map 1**).
    - Site is between Haldon Arm Road & Lake Benmore, as seen on Page 15 (p. 41/181 of PDF numbering) of the Substantive Application.
    - Proposal includes solar arrays, battery energy storage system (BESS), earthworks for roading and cabling, and a substation facility to connect to overhead lines running through the site.
    - The design uses a single module configuration (1P) with:
    - a single axis tracking table that typically results in a ground cover ratio of approximately 40% when modules are in the 90 degree (horizontal position).
    - The solar module array is a linear structure, and along the array there will be undulations in the topography which do not need to be levelled or infilled during construction. In those locations, the height between the bottom of the undulation and the top of the module may be slightly larger than 2.6 m but should not exceed 3 m in height.
    - Construction of perimeter deer fencing at a height of approximately 2.0 m, including a rabbit fence along the lower portion, is proposed.

2. The proposed solar farm will alter environmental conditions of 320ha of ecologically significant dryland habitat. These changes will favour exotic plant species and exclude / reduce the abundance of native dryland species. This will result in unavoidable residual effects for which compensation and offsets would be required.

3. Solar farms are not compatible with maintaining ecologically significant dryland values due to the inherent disturbance of land surfaces on which such values arise and the

alteration of microclimates (i.e., moisture gradients) in which indigenous species persist. Solar farm development also risks adversely impacting freshwater avifauna and their habitat.

4. The best way to avoid these impacts is to locate solar farms outside the Mackenzie Basin. Should solar farms be established within the Mackenzie Basin, the best way to avoid impacting terrestrial ecology values is to limit such developments to already Converted and Partially Converted Land (**Attachment 1**).

5. Key concerns of the proposal for terrestrial ecology include:

   I. Direct disturbance of avifauna, invertebrate and lizard habitats and vegetation clearance to install pilings, roading infrastructure or undertake levelling of site landforms including naturally uncommon inland outwash gravels ('cut and fill' activities).

   II. Changes to soil moisture gradients; shading and stormwater management will transform environmental conditions of 320ha of ecologically significant dryland habitat. These changes will favour exotic plant species and exclude / reduce abundance of native dryland vegetation and, potentially, the associated fauna.

   III. Loss of (potential) bird habitat. Threatened or at-risk species including the NZ pipit, banded dotterel, black-fronted tern, black-billed gull and SI pied oystercatcher might be affected through loss of foraging or nesting habitat.

   IV. Bird strike. Mortality of birds may occur through collisions with solar farms, electrocution, and secondary predation of injured or stunned birds. In Aotearoa this issue is an unresolved risk.

6. These concerns for terrestrial ecology are very similar to those I recently identified in my review of another solar farm proposal nearby – the Far North Solar Farm[1] - and as considered for a solar farm proposed near Lake Tekapo, currently under appeal to the Environment Court after joint hearing commissioners for Mackenzie DC and Environment Canterbury refused the consents in November 2023 based on these ecological concerns[2].

7. Given the context of this proposal with other nearby solar farm developments (**Attachment 2**), consideration for cumulative effects on terrestrial ecology (and other matters) is warranted.

8. I set out below my review of the Application, the associated Ecology Report, and the proposed conditions with respect to potential effects on terrestrial ecology.

9. An overview of my advice is provided in **Table 1**.

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[1] Also currently being considered under the Fast-track Approvals Act 2024.

[2] McGarry, S., Justice, M., & Millar, D. (2023, November 8). *Joint report and decision of the hearing commissioners: Applications CRC224567, CRC230898 & RM220048 (A. W. & K. F. Simpson—solar array, 397 Braemar Road, Tekapo)*. Mackenzie District Council & Canterbury Regional Council (Environment Canterbury).

Map 1: The proposed solar farm footprint and layout as presented by Figure 3 of the Ecology Report (Page 7). Lower image shows solar array layout in greater detail illustrating gaps between panels which may mitigate the risk of bird strike.

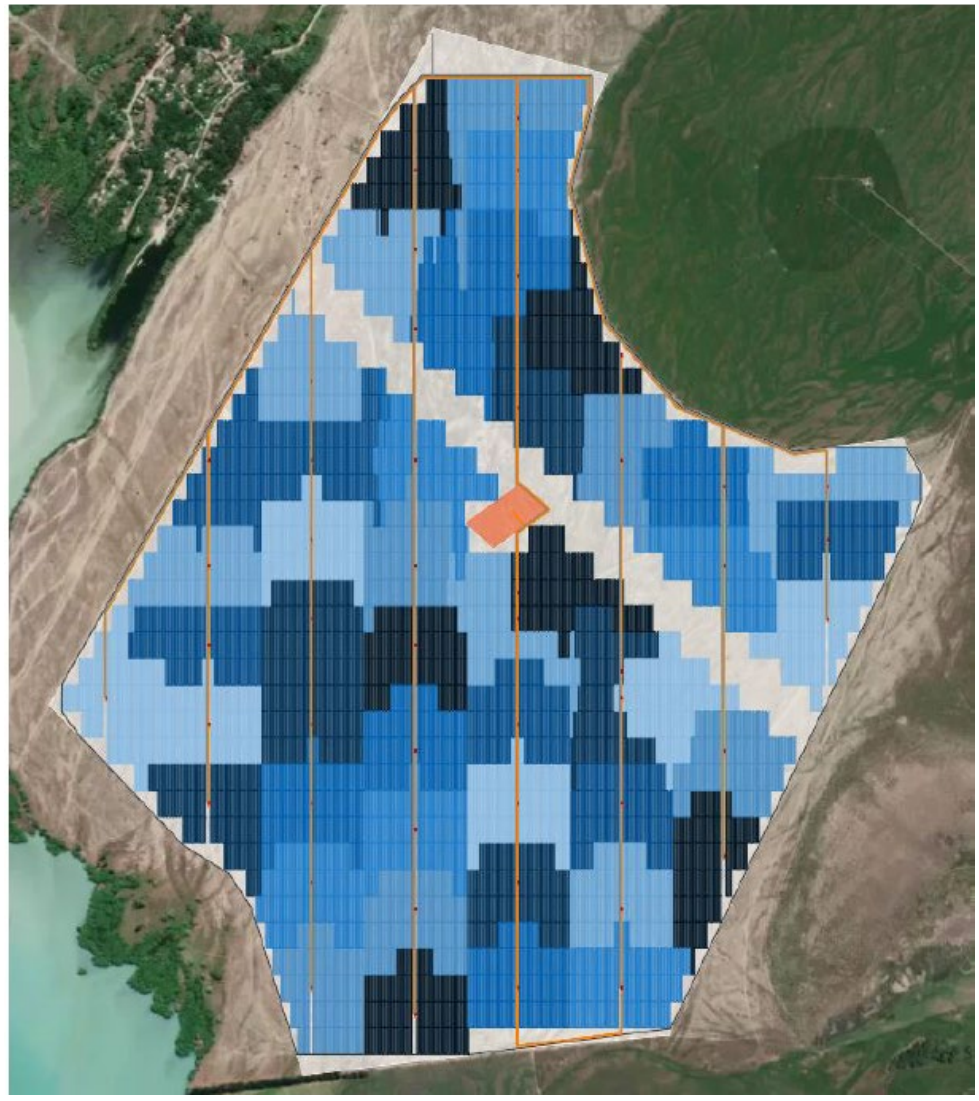

Table 1: outstanding areas of contention		
Outstanding area of contention	**Reason for significance**	**Solution**
Changes to soil moisture gradients; shading and stormwater management will transform environmental conditions of 320ha of ecologically significant dryland habitat. **Level of effect** I consider the potential level of effect to be: Significant - Moderate level of effect.	Loss of 320ha of ecologically significant habitats. These changes will favour exotic plant species and exclude / reduce abundance of native dryland vegetation and associated fauna.	Residual effects unavoidable. Consider compensation and or offsets. Proffered condition: a Plant Monitoring Plan. Review by a suitably qualified and experienced practitioner. This may provide insights into the effect but will not manage it.
Construction disturbance Direct disturbance of habitats and vegetation clearance to install pilings, roading infrastructure, perimeter and ESC fencing, or undertake levelling of site landforms including naturally uncommon inland outwash gravels ('cut and fill' activities). **Level of effect** I consider the potential level of effect on indigenous vegetation from construction to be of a Significant - Low-Moderate level. I consider the potential level of effect on avifauna from construction to be Significant - Low-Very Low.	Loss of ecologically significant habitats and naturally uncommon ecosystem landform. Outwash gravel landforms cannot be restored once cleared/removed. Disturbance of avifauna breeding habitat during construction could result in the loss of nests and chicks.	No cut and fill activities. If not already, undertake pile testing to ascertain if disturbance predictions for pile driving is accurate. Ground disturbance mitigations: Works to avoid construction following or during rainfall and frost events / when surface ponding is apparent or soils are saturated/frozen. Habitat disturbance avoidance and mitigations: Collate detailed vegetation and habitat mapping of the site: • Address survey deficiencies for invertebrates and lizards. • Identify notable ecological features to avoid including occurrences of mat daisies, spatially dominant areas of Muehlenbeckia axillaris and potential invertebrate and lizard habitats. • Utilise pre-work bird surveys or, as suggested by the Ecology Report, avoid works during the nesting season [p.43].

Potential impacts on lizards and invertebrates are unclear due to data deficiencies.		Partial remediation: establishment of habitats such as stone piles and consideration of perimeter fencing design to benefit herpetofauna. The cost of this may be comparable in price and logistics to the already proffered deer and rabbit fencing, and stone piles might be sourced from earthwork spoils. Discrete plantings for herpetofauna might be established near Transect 7 within moister areas (Ecology Report). These would not affect landscape considerations and not require irrigation to establish. Biosecurity to avoid introduction of new weed species to the site is also noted by the Ecology Report.
Loss of bird feeding and breeding habitat. **Level of effect** is conservatively assessed as Significant - potentially Low-Moderate level.	Threatened or at-risk species including the NZ pipit, banded dotterel, black-fronted tern, black-billed gull and SI pied oystercatcher might be affected through loss of foraging or nesting habitat.	Residual effects unavoidable. Consider compensation and or offsets. A programme of pest control within the exclusion area is proffered. - Pest control is best with a predator proof fence but for avifauna benefit must include control of cats, mustelids, rats and hedgehogs.
Bird strike risk. Mortality of birds may occur through collisions with solar farms, electrocution, and secondary predation of injured or stunned birds. In Aotearoa this issue is an unresolved risk. **Level of effect** is Uncertain.	While potential impacts of solar farms are unlikely to exceed existing pressures on vulnerable species, they may introduce an additional stressor that further exacerbates already small and or declining populations such as the black-fronted tern or kaki.	No known, easy fix. Establish solar farms and undertaken monitoring at alternative locations first to ascertain the risk of this potential effect prior to establishing solar farms in the Mackenzie Basin – an internationally important area for freshwater avifauna. Consultation with the Department of Conservation to inform the management of this potential effect and any proposed Avifauna monitoring plan is important. Potential mitigations (some of which are proffered):

		•Providing clear areas between solar panel arrays may allow birds to navigate the access corridors and avoid bird strikes when landing or departing from the site. Gaps between panels to avoid presenting a continuous visual stimulus that looks like a lake – the proposal notes max ground cover when panels are horizontal of 40% [Ecology report page 6]. •Positioning of panels at night to avoid reflection of light •Anti-reflective coatings to panels (inferred by Application but not confirmed). •Minimise night lighting •Monitoring of the solar farm should be undertaken before and after the construction phase and during the lifetime of the solar farm, to assess whether mortality due to bird strike occurs. •Adaptive management – although the feasibility of adaptive options is unclear.

Agreement with the applicant

10. I agree with the Applicant regarding:

    i. The potential mitigations to address potential effects on nesting birds during construction;

    ii. Uncertainty regarding the potential level of effect of the proposed solar farm operations on avifauna feeding habitat and the potential for bird strike;

    iii. The solar array will increase moisture levels across the site;

    iv. Fencing will provide positive benefits for grazing sensitive [introduced] vegetation. (Further consideration of outcomes from fencing is necessary).

11. I disagree with the Applicant's conclusions on a number of points and address these in the following sections. These include:

    i. The approach to assess potential adverse effects of the project in terms of an overall level of effect, as well as overall levels of ecological value and magnitude of effect used to determine level of effect.

    ii. The ecological significance of the site and its values – there are significant.

    iii. The extent of ground disturbance - this will be greater than predicted.

    iv. The level of effect on indigenous vegetation – this will be significant (Low-Moderate) rather than Very Low.

    v. The level of effect on invertebrates and lizards, although this is hampered by a lake of survey data.

    vi. Removal from grazing does not promote indigenous community recovery – contrary evidence exists to suggest recovery does occur when grazing is removed.

Benefits of the project

12. Fencing may inadvertently improve habitat complexity for invertebrate and lizards due to increased grassland sward density.

13. Pest control is mentioned by the Application, and this may benefit indigenous flora and fauna; however, I have not seen the detail of this proffered action.

14. Monitoring proposed as part of the development could provide insights into how solar farms affect terrestrial ecology, thereby informing future development decisions and management approaches.

Outstanding areas of contention and significance of these.

Discussions with applicant

15. I have had no expert discussions with Applicant or their experts.

Outstanding areas of contention

16. The Application and its associated Ecology Report underestimate the potential for terrestrial ecology to be adversely affected by the proposal.

17. In the following sections I review of the proposal's approach to ecological significance and determination of level of effect and consider the effects on terrestrial ecology relating to: ground disturbance, indigenous vegetation and fauna including avifauna (birds), herpetofauna and invertebrates.

18. Importantly, a 'low' effect is still a significant adverse effect that will, if unmitigated, result in loss of significant indigenous biodiversity values and is therefore not consistent with Resource Management Act and Canterbury Regional Policy Statement requirements to protect (s6c) and maintain (s 30) biodiversity.

19. Each section highlights where I consider the Application or Ecology Report to have underestimated the nature or scale of potential adverse effects, and where additional assessment, consultation, or precautionary management is required – or where proffered impact management is supported.

Ecological significance

20. Contrary to the Ecological Report, I consider the site would meet criteria of rarity and distinctiveness and ecological context. While somewhat data deficient (see my comments with regards to faunal survey below), the site would meet significance Criteria 4, 6 and 8 of the Canterbury Regional Policy Statement.

21. The site meets Criteria 4 as it supports at least four at-risk plant species and likely supports several threatened animals including freshwater birds such as black-fronted terns (Nationally Critical) which likely forage across the site. Criteria 6 is met. Albeit of only moderate distinctiveness, the association of species and or spatially discrete areas where indigenous plants dominate, occur on a naturally uncommon ecosystem (inland outwash gravels). And Criteria 8 is met as the site contributes to a network of dryland environments, including its bare soil and stoney substrates, which allow indigenous species adapted to harsh dryland environments to persist across their natural range.

22. The Ecology Report also considers[3], perhaps unnecessarily[4], the site's flora in terms of it meeting Significant Natural Area (SNA) criteria of the National Policy Statement for

[3] Ecology Report [p.38]

[4] The National Policy Statement on Indigenous Biodiversity Section 1.3 nullifies the application of the instrument for considerations of renewable electricity generation asset development.

Indigenous Biodiversity 2023 (NPSIB). And concludes the site does not qualify as an SNA as the flora are widespread – meeting an exclusionary provision of the instrument[5].

23. While I agree that the site would not qualify as a SNA if the sole basis for its identification were the presence of at-risk plant species which are widespread, there are other criteria under which the site does meet the SNA threshold (see above). The exclusionary provision applies only where Threatened, or At-Risk plant species are the sole reason for ecological significance.

Level of environmental effects – approach of the Applicant and Ecology Report

24. The Application AEE summarises that *No anticipated adverse environmental effect of the Project has been assessed to be more than minor[6].*

25. Both the Application[7] and the Ecology Report[8] provide an overall assessment of the ecological values at the site being low. Such overall assessment is unhelpful to the management of ecological effects, which needs to consider each potential effect rather than average these out and thereby downplay effects of concern.

26. The level of effect concluded by the Ecology Report was based on an overall impact of the project and an overall assessment of effect. As noted above, this is unhelpful when determining potential effects on certain ecological values. Rather, level of effect on an ecological feature requires consideration of its value and the magnitude of any potential effect on that feature. A feature might be a population, habitat or community, and may be considered at various scales and contexts (i.e., site, ecological district, region or national/international).

Ground disturbance.

27. Ground disturbance, and consequently vegetation clearance, will result from earthworks associated with piling, cable trenching, roading and building/substation foundations. Stockpiling, laydown areas, erosion and sediment control measures and fencing will involve further ground disturbance.

28. Page 85 of the Application states *The installation of the solar panels will involve piling with minimal ground* disturbance and estimates only 13 hectares of vegetation clearance. The Ecology Report also considers only small areas will be disturbed by the development. I disagree with this.

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[5] Appendix 1, clause 1(3) of the National Policy Statement for Indigenous Biodiversity 2023 sets out criteria for what qualifies as an SNA including exclusion from such qualification where an area qualifies solely on the grounds that it contains one or more indigenous flora species that are Threatened or At Risk (declining), and those species are widespread in at least three other regions.

[6] Application *[section 6.14, p.94].*

[7] Applications [p.39].

[8] Ecology Report [p.40].

29. Disturbance will very likely exceed that of the estimated earthworks footprints[9]. In my experience and observations of other solar farm development, the establishment of solar arrays and its associated infrastructure require heavy machinery to track across much of a site causing significant disturbance to any landform and associated vegetation. The risk of this is exacerbated by any works carried out during or after rainfall or frost events when surfaces are more vulnerable to damage from heavy vehicle tracking.

30. It is also unclear whether any pile testing has been carried out. Should the outwash gravels present difficulty in pile driving (i.e., bouldery substrates preventing direct piling), additional earthworks and ground disturbance to that initially estimated will result.

31. Solar farm applicants commonly characterise construction disturbance as minor, on the basis that works affect only the shallow soil horizon rather than deeper profiles. Consequently, such disturbance is treated as negligible, particularly when proposals are compared with larger earth-moving projects. However, much of the site's biodiversity arises from and is maintained by microclimates created by the subtle microtopography of the outwash gravel landform. These values occur within the shallow soil horizon (<15 cm) and on the surface, including lichen-encrusted stones and widespread moss fields.

32. Associated with ground disturbance is the Applicants proposed dust and erosion management[10]. Dust management often includes establishing grass cover directly following disturbance while water is often applied to reduce exposed soil becoming airborne. Erosion management, as outlined by the proposed conditions, might include the laying down of gravel or mulching strips beneath solar panels and the establishment of silt fencing. Such dust and erosion mitigations will be averse to any indigenous dryland vegetation and its recovery.

Indigenous vegetation

33. The Ecology Report states that the site no longer comprises indigenous vegetation. However, the Mackenzie District Plan defines indigenous vegetation as *a community of vascular plants, mosses and/or lichens that includes species native to the ecological district*[11]. The vegetation of the site includes such a community and therefore is considered indigenous vegetation from a planning perspective.

34. The Ecology Report refers to the extent of locally protected conservation areas[12], correctly noting that the site area occurs within a 'critically under-protected' land environment where only 10% of this environment is protected.

35. The vegetation assessment utilised a stratified random design incorporating plot sampling along multiple transects. I am aware that sampling mixed indigenous-exotic plant communities such as that of the project site requires consideration of the spatial

[9] Application [p.57]

[1010] Application [p.92]

[11] Mackenzie District Plan, Definitions, Section 3 – Definitions, updated Dec 2023.

[12] Ecology Report [p.27

clustering of indigenous species to avoid lower than actual estimates of their occurrence[13]. I am however not experienced with the vegetation assessments undertaken by the Ecology Report and recommend its approach, and findings are reviewed by a suitably qualified biostatistician familiar with the monitoring of Mackenzie Basin vegetation to ascertain its appropriateness and conclusions. If requested, I can suggest suitably qualified and experienced persons.

36. Four vascular native plants with conservation status of 'at-risk' were reported to occur at the site by the Ecology Report. These included desert poa (*Poa maniototo*), scabweeds (*Raoulia australis* and *R. beauverdii*) and the celadon mat daisy (*R. parkii*). The desert poa was common across all four transects of the proposed solar farm footprint, while the location of the scabweed and mat daisy is unclear as these were not recorded within measurement plots, presumably observed outside plot areas. The Ecology Report also lists the native herb *Luzula ulophylla* from its plot assessments[14], however does not account for this in its presentation of the conservation status of native vascular species[15].

37. Other native vascular plants recorded include relatively frequent sedges (*Carex* spp.), orchids (*Microtis uniflora* and *Thelymitra longifolia*) and *Muehlenbeckia axillaris*. This latter species was prevalent across transect five, and, as a host plant to native butterflies, has implications for fauna (see below).

38. Non-vascular plants included approximately six native mosses while native lichen, primarily the At-Risk Resurrection lichen (*Xanthoparmelia semiviridis*) alongside *X. reptans*, and *X. mougeotina*, are prevalent across the site. Resurrection lichen is a windblown species that occupies large areas of the Mackenzie Basin. While secure overseas it is At-Risk in New Zealand due to incremental loss of suitable dryland habitat and is prone to extreme fluctuations in distribution[16].

39. Collectively, this suite of species has moderate value - which is somewhat recognised by the Ecology Report[17]. Although the species persist within a community now dominated by exotic plants, together they represent a distinctive assemblage of indigenous species whose continued presence, although sparse, is important, as comparable groupings are seldom found elsewhere in New Zealand outside the Mackenzie Basin.

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[13] Walker, S., Price, R., & Rutledge, D. (2016). Sampling method and sample size affect diversity and indigenous dominance estimates in a mixed grassland community. *Ecological Indicators, 66*, 306–314.

[14] Ecology Report [p. 31], Table 7.

[15] Ecology Report [p.32], Table 8.

[16] de Lange, P., Blanchon, D., Knight, A., Elix, J., Lücking, R., Frogley, K., Harris, A., Cooper, J., & Rolfe, J. (2018). Conservation status of New Zealand indigenous lichens and lichenicolous fungi, 2018. New Zealand Threat Classification Series 27. Department of Conservation, Wellington. 64 p. and Knight, A. (2019). Lichens of New Zealand: An introductory illustrated guide. Dunedin.

[17] At page 47 the Ecology Report states that if weight is placed on the threat ranking of the four At Risk, Declining [plant] species then the areas ecological value would be Moderate.

40. As noted by the Ecology Report these species occur elsewhere within the Mackenzie Basin, including within conservation estate reserves[18]. However, the conservation status of these species takes this into account. Rather it is the sparseness of the known occurrences of these plants, habitat loss and modification of the dryland habitats they occupy, and a general lack of data which raises their conservation status. Further loss of these species and their potential habitat would exacerbate their conservation status.

Potential effects on indigenous vegetation

41. The Ecology Report states that *the occurrence of Poa maniotito and lichens are attributable to survival or expansion in the modified open secondary succession dryland vegetation with greater light availability, and this is not likely to be significantly altered by solar development*[19]. I disagree with this conclusion, as it is my understanding that solar arrays will significantly alter solar radiation reaching the ground and will alter moisture gradients to the detriment of the indigenous species. This is confirmed as much by the Application:

42. The Application states: *Overseas studies suggest that the main environmental effects of shading from solar arrays are reduced incident radiation, reduced wind ground speed, reduced vapour pressure deficits and increased soil moisture. Drawing on studies undertaken in a fescue tussock grasslands environment on the west of Lake Tekapo, the imposition of artificial shade is anticipated to increase total species richness and cover, whilst reducing the cover of bare ground, lichens, and wire moss. Invasive weed species may increase, but could be managed, if necessary, via ongoing control*[20].

43. The anticipated changes to soil moisture gradients; shading and stormwater management will alter environmental conditions of 320ha of ecologically significant dryland habitat. These changes will favour exotic plant species and exclude / reduce the abundance of native dryland species.

44. The potential impact of additional moisture on both vascular and non-vascular species is indicated by the findings of the Ecology Report where moist areas did not support these native species[21]while the exotic sweet briar shrub increased in both density and growth[22].

45. Solar farm development will also cause direct disturbance to the site's indigenous vegetation from its ground disturbing activities. And post construction conditions will favour the reestablishment of exotic vegetation.

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[18] Ecology Report [p.38].

[19] Ecology Report [p.42].

[20] Application [p.85]; and also noted by the Ecology Report [p.44].

[21] Ecology Report [p.29], Table 4.

[22] Ecology Report [p.33], Table 9.

46. The proposed deer and rabbit fencing[23] will exclude grazing from the site (presumably stock is to be excluded). The Application considers this will provide positive benefits for grazing sensitive vegetation. It is unclear if this is with reference to native or introduced species, however the findings of the Ecology Report would indicate the latter. Findings from the long-term exclosure area at Haldon Station indicate that without grazing the cover of exotics including Hieracium and chewings fescue as well as infrequent native plants remain constant, while introduced grasses and herbs replace bare soil and stone.[24]

47. The the Ecology Report presents results from long-term studies of the effects of grazing and browser exclusion on vegetation in the Mackenzie Basin[25]and concludes that the removal from grazing does not promote indigenous community recovery, and the area is not capable of recovery. These conclusions are disputed. Other research has demonstrated recovery of dryland outwash communities following grazing removal can and does occur and that Hawkweed (*Hieracium*) invasion did not retard recovery.[26]

48. In summary, construction activities will directly remove some native vegetation and lichen cover, the increased moisture levels due to panel shading will further reduce native species cover, and fencing will have uncertain benefit for native vascular plants while potentially reducing habitat for non-vascular plants and lichen. Further consideration on the benefits of fencing is required.

49. Adopting the approach of the Ecology Report with regards to the EIANZ guidelines, the ecological value of the vegetation is, as assessed by the Ecology Report, Moderate (assuming weight is, as it should be, placed on the occurrence of four At-Risk species). The Ecology Report considers the magnitude of any adverse effect on vegetation arising from the development to be negligible. I disagree with this assessment due to my understanding of the likely changes the development will have on the sites microclimate which supports the persistence of the indigenous species throughout the site. And due to my anticipation for much broader ground disturbance than estimated by the Application. While I agree the species are widespread and occur elsewhere, I would still consider the permanent (>25years) loss of 320ha of habitat for these species to present either the alteration of a key element of baseline conditions (i.e. dryland conditions) or at least a minor shift away from baseline conditions, and that this will have some effect on the various populations. This Low to Moderate magnitude of effect coupled with the vegetation's Moderate value would amount to a Low-Moderate level of effect.

50. While potential impacts of the proposal on indigenous vegetation may be low, the cumulative and interlinked consequences of ongoing indigenous biodiversity losses in the Mackenzie Basin compounds adverse effects on remaining biodiversity, amounting to a significant effect on indigenous biodiversity.

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[23] The Application [p.85] – [p.86].

[24] Ecology Report [p.29], Table 5.

[25] Ecology Report [p.24] and [p.37].

[26] Walker, S., Comrie, J., Head, N., Ladley, K. J., & Clarke, D. (2016). Hawkweed invasion does not prevent indigenous non-forest vegetation recovery following grazing removal. *New Zealand Journal of Ecology*, 40(1), 137–149

51. Mitigation for indigenous vegetation impacts could include the mapping and avoidance of mat daisies, spatially dominant areas of Muehlenbeckia axillaris or other native plants.

Wetlands

52. From desktop review wetland habitats appear to occur at the south-west extent of the proposed solar array footprint. It is unclear if these areas were formally surveyed to ascertain wetland status and extent (**Attachment 3**) however the Ecology Report notes seepage depressions at the sites southern extent were dominated by non-hydrophytic species[27].

53. If present within the wider area, these wetland habitats adjacent to Lake Benmore would not be considered natural inland wetlands under the National Policy Statement for Freshwater 2020 as they have been induced by the constructed waterbody of the lake. However, they may provide habitat to indigenous fauna and thereby warrant consideration for potential effects of the proposal (see below fauna considerations).

Fauna – Avifauna assessments

54. Avifauna populations and their habitat found within the MacKenzie Basin are ecologically significant and nationally important. Endemic and Threatened or At-Risk species which might fly over the site or utilise its habitats for feeding or breeding include banded dotterel (*Charadrius bicinctus bicinctus*), black-billed gull (*Larus bulleri*), black-fronted tern (*Chlidonias albostriatus*), black stilt (*Himantopus novaezelandiae*), South Island pied oystercatcher (*Haematopus finschi*) and wrybill (*Anarhynchus frontalis*).

55. The Ecology Report recorded two Threatened or At-Risk avifauna at the site including black-fronted tern and variable oystercatcher (*Haematopus unicolor*). This latter species would be an unusual sighting as this is a coastal species rarely seen so far inland. Additionally, the report notes the threat status of this species as Not Threatened, however it is At-Risk - Recovering[28]. More likely the observed species was the South Island pied oystercatcher; however, this could be clarified with the report author(s).

Potential effects on avifauna

56. The site is located at a hot spot for Nationally Threatened and At-Risk bird species which frequent the Ohau-Tekapo river delta at Lake Benmore. Flight paths of these birds are known to traverse directly across the proposed solar farm site. This is known in detail for at least one species – black fronted tern - from recent research which placed transmitters on birds' flight revealing their flight routes[29] (see **Attachment 4**).

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[27] Ecology Report [p.13].

[28] Robertson, H. A., Baird, K. A., Elliott, G. P., Hitchmough, R. A., McArthur, N. J., Makan, T. D., Miskelly, C. M., O'Donnell, C. F. J., Sagar, P. M., Scofield, R. P., Taylor, G. A., & Michel, P. (2021). *Conservation status of birds in Aotearoa New Zealand, 2021*. New Zealand Threat Classification Series 36. Department of Conservation, Wellington. 43 p.

[29] Gurney F.E. 2022: Breeding movements and post-breeding dispersal of black-fronted terns/tarāpirohe (Chlidonias albostriatus) in the Mackenzie Basin. Master of Science thesis, Lincoln University. 96p.

57. The implication of this is that a solar farm development at this location presents a risk of bird strike and the potential loss of feeding and breeding habitat. Construction activities might also disturb nesting birds.

58. Bird mortality associated with solar farms—due to collisions and secondary predation of injured or disoriented birds—has long been recognised as a significant environmental impact overseas. In New Zealand, the risk posed by collisions with solar panels remains an unresolved concern, particularly for mobile wetland species and at sites where a relatively high proportion of threatened bird species are present – such as in the MacKenzie Basin.

59. Although bird strike risk of solar farms has not yet been studied in N.Z., I consider the range of adverse effects documented in overseas studies are likely.

60. While the potential impacts of solar farms are unlikely to exceed existing pressures on these species, they may introduce an additional stressor that further exacerbates already small and or declining populations[30].

61. There are no known easy fixes for bird strike risk, however several mitigations have been suggested including solar array spacing (as proposed by the Application[31]), positioning of panels at night, anti-reflective coatings, minimization of night lighting and, importantly, monitoring and adaptive management. Although the feasibility of adaptive management once a solar farm is established, particularly if the mitigation provisions noted above are already adopted as would be recommended here, is questionable.

62. The precautionary approach to resolve this risk is to undertake monitoring of solar farms for bird strike at locations of less importance to avifauna - prior to their establishment within a nationally important habitat area such as the Mackenzie Basin.

63. I recommend that consultation be undertaken with the Department of Conservation, specifically with their technical science advisors and ornithologists, to ensure the decision maker is fully informed of the potential effects on freshwater avifauna and appropriate management measures.

64. Appropriate mitigation to address potential disturbance to nesting birds during construction, as suggested by the Ecology Report, might include avoiding the breeding season or undertaking pre-work bird surveys.

65. The Ecology Report is unsure if solar arrays will affect avifauna foraging. While the foraging habitat appears to be of low value to avifauna, given the uncertainty, I would conservatively consider feeding habitat might be impacted to a Low-Moderate degree and the residual effects of this unavoidable.

Herpetofauna

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[30] In particular, black-fronted tern number approximately 5,000 individuals and face declines of 10-15%; black stilt number only around 150 wild birds with recruitment dependent on a captive breeding programme (Hitchmough et al. 2021).

[31] The Application [p.85]

66. Seven lizard species are potentially present at the site, based on records within a 15-kilometre radius, and these include: McCann's skink (*Oligosoma maccanni*, Not Threatened), Southern grass skink (*Oligosoma* aff. *polychroma* Clade 5, At Risk – Declining), Southern Alps gecko (*Woodworthia* "Southern Alps", At Risk – Declining), Jewelled gecko (*Naultinus gemmeus*, At Risk – Declining), and three Threatened – Nationally Vulnerable larger bodied skinks including Scree skink (*Oligosoma waimatense*), Mackenzie skink (Oligosoma prasinum) and Lake's skink (*Oligosoma* aff. *chloronoton* "West Otago")[32] (**Attachment 5**).

67. Of these, and as recognised by the Ecology Report, the species most likely to occur at the site are McCann's skink and Southern grass skink. I would expect Southern Alps gecko is also possible albeit to a lesser degree, while the large-bodied skinks are unlikely but cannot be ruled out. Survey effort has been limited across the site and the wider area generally, so the available information is limited.

68. While information provided, including a few photographs of the area, and desktop aerial imagery indicates the habitat complexity across most of the site is low and presents poor habitat quality, I consider a substantial level of uncertainty remains with regards to sites herpetofauna assemblage.

69. Methodology employed to survey herpetofauna included pitfall traps of a depth of 10.5cm. This is inadequate to trap all lizards, particularly large-bodied species such as the Mackenzie skink which occurs in the wider area. While any size pitfall might be used, depths need to ensure the largest individuals of the target species cannot climb out[33]. Typically, a depth of 11.5cm is required to trap small-bodied skinks (such as the McCann's and Southern grass skinks, likely to be found at this site). And depths of 18cm or more would be needed to trap large-bodied skinks. Surveys were also of a limited extent and replication (10 traps across 320ha), and it is not clear if traps were micro-sited to increase the likelihood of detection of lizards. It is also unclear if all apparent habitat at the site was surveyed (see below). Furthermore, survey conditions (i.e., weather, temperature, wind speeds) although noted as suitable were not recorded to verify conditions were optimal to detect lizards[34].

70. From desktop review potential habitat of lizard (and other fauna) appears to occur at the southern and eastern extents of the proposed solar array footprint near both the lake and Mt Maggie. It is unclear if these areas were searched or formally surveyed. Much of this potential habitat lies outside the proposed footprint (**Attachment 6**), however it is recommended potential habitat is surveyed and or avoided, including the adoption of exclusion zones for any construction activities from potential habitat areas.

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[32] Threat status of lizards from Hitchmough, R.A.; Barr, B.; Knox, C.; Lettink, M.; Monks, J.M.; Patterson, G.B.; Reardon, J.T.; van Winkel, D.; Rolfe, J.; and Michel, P. 2021: *Conservation status of New Zealand reptiles, 2021*. New Zealand Threat Classification Series 35. Department of Conservation, Wellington.

[33] Hare, K. M. (2012). *Herpetofauna: pitfall trapping* (Version 1.0). *Inventory and monitoring toolbox: herpetofauna*. Department of Conservation. (DOCDM-760240).

[34] Generally, Oct-Apr is suitable for lizard surveys in Canterbury. Optimal conditions vary with the methods used (e.g.for checks of Onduline the optimal temperature range is c. 12-18 degrees (too hot or cold and lizards are not undernearth the Onduline retreats)). Similar temps are good for visual searching but if live (pitfall or funnel) trapping if undertaken much warmer temperatures are recommended.

71. Potential effects on lizards primarily relate to injury, death and disturbance from construction activities, while solar arrays may reduce habitat quality due to shading and habitat fragmentation.

72. The proposal may also enhance lizard habitat, as the vegetation cover predicted to increase with the establishment of the solar array and fencing could add to habitat complexity.

73. I recommend that further consideration of habitat and surveys occur to inform the assessment of effects, or that potentially suitable habitat is identified and avoided/considered. Perimeter fencing design might also consider any benefits to the inclusion of habitat areas for lizards.

74. Appropriate survey methodology would require a permit to be attained under the Wildlife Act 1953 from the Department of Conservation to catch and handle lizards or disturb their habitat.

Invertebrates

75. Invertebrates were not formally assessed by the Applicant. The Ecology Report, albeit with a lack of survey, considered invertebrate populations not to be at risk from the development due to the limited extent of invertebrate habitat anticipated to be disturbed by the development[35] (see my comments regarding ground disturbance, paragraph 27 - 32).

76. When concluding that invertebrate habitat will not be appreciably altered the Application equates ground disturbance to 0.4% of the total site area,[36] which is incorrect as 13 hectares across a 320-hectare site equates to 4%. As noted above, I anticipate the area of disturbance would be greater than 4%.

77. Several invertebrate species of conservation concern may occur at the site. As noted by the Ecology Report these include the robust grasshopper (*Brachaspis robustus*, Threatened – Nationally Endangered; Trewick et al. 2022) and the minute grasshopper (*Sigaus minutus*, Threatened – Nationally Vulnerable; *Ibid.* 2022), and – I would add - the short-horned grasshopper (*Phaulacridium otagoense*, At Risk – Declining).

78. Moth species were considered; however, butterflies (Papilionoidea) were not. The Southern blue butterfly (*Zizina oxleyi*, Not Threatened[37]) and copper butterflies (*Lycaena* spp.[38]) are also likely to be present. While specific surveys for these taxa were not undertaken, their known distributions overlap with the wider Mackenzie Basin, and the

[35] Ecology Report [p.4].

[36] Application [p.40]

[37] Hoare, R. J. B., Dugdale, J. S., Edwards, E. D., Gibbs, G. W., Patrick, B. H., Hitchmough, R. A., & Rolfe, J. R. (2017). Conservation status of New Zealand butterflies and moths (Lepidoptera), 2015. New Zealand Threat Classification Series 20. Department of Conservation, Wellington. 13 p

[38] The genus is under ongoing taxonomic research.

habitat characteristics of the site, including host plants[39] being present throughout the site as well as and nearby observations[40], suggest their occurrence is likely.

79. I recommend further surveys occur to inform the assessment of effects and, if consent was granted, that conditions minimise ground disturbance.

Uncertainty.

80. Uncertainty is acknowledged throughout the Ecology Report regarding the level of effects, particularly on fauna.

81. The Ecology Report recognises uncertainty when considering effects on terrestrial ecology. These uncertainties are stated by the report[41] including:

82. *The subsequent effect of solar arrays on avian breeding or habitat use is not known in New Zealand*…

83. The long term effects of solar panels in the Mackenzie Ecological Region are unknown as no solar farms have been built. Overseas studies show that the main environmental effects from solar arrays are reduced incident radiation, reduced wind ground speed, reduced vapour pressure deficits and increased soil moisture.

84. How solar arrays affect Mackenzie birds is unknown…

85. *The effect of shading on sweet briar is not known*…

86. I highlight this issue of uncertainty as it is important to consider when contemplating effects that, although they might be unlikely, they may be significant, and a precautionary approach is warranted.

Proposed conditions

87. The Application notes the following proffered management and monitoring of potential effects including:

i. Construction and maintenance of a rabbit proof fence around the site over the life of the project for purposes of rabbit exclusion; and

ii. A programme of pest control within the exclusion area; and

iii. a Plant Monitoring Plan under the guidance of a suitably qualified and experienced practitioner in plant ecology with the objective of determining

[39] Host plants for copper butterflies include Muehlenbeckia axillaris (this was present in all plots of transect 5 and some plots of transect 6 across the proposed solar farm footprint); host plants for blue butterflies include legumes (Fabaceae) including clovers (Trifolium spp.) which was recorded in plots along all transects of the proposed solar farm footprint.

[40] iNaturalist. (n.d.). *Observations of Zizina oxleyi & Lycaena (map view)*. Retrieved 13 September 2025, from https://www.inaturalist.org/observations?subview=map&taxon_id=366343; https://www.inaturalist.org/observations?subview=map&taxon_id=54010

[41] Ecology Report [p.43]-[p.44].

changes in plant communities amongst and beneath the solar installation and to monitor their responses to reduced pressure from rabbit browsing; and

iv. an Avifauna Monitoring Plan under the guidance of a suitably qualified and experienced practitioner in avifauna with the objective of determining any interactions (positive or negative) between birds and the solar installation.

88. As discussed above the consequence of fencing is uncertain or is anticipated to have limited benefit for indigenous vegetation, although may offer some habitat improvement for lizards.

89. The proposed programme of pest control within the exclusion area. This may have benefit to both indigenous vegetation and fauna if carried out with sufficient intensity and scale. For avifauna control of cats, mustelid, rats and hedgehogs would be necessary. Monitoring of pest control outcomes would be required to ascertain the programme's effectiveness.

90. The Plant and Avifauna Plan should be reviewed by suitably qualified and experienced persons.

91. As noted in my review of the Ecology Report, the technical ornithologists from the Department of Conservation should be engaged to review any avifauna management approach.

92. And a suitably qualified biostatistician familiar with the monitoring of Mackenzie Basin vegetation would best be engaged to ascertain any Plant Monitoring Plan to ensure its ability to determine changes in plant communities from solar farm development. If requested, I can suggest suitably qualified and experienced persons.

93. While Plant and Avifauna Plans might assist with further understanding the effects of the solar farm development on terrestrial ecology, they will not mitigate the potential effects themselves.

Conclusions and recommendations

94. I disagree with the assessment of effects provided by the applicant ecologist which did not follow the statutory ecological assessment criteria or an appropriate effects assessment process.

95. The most obvious unavoidable adverse effect of this proposal will be direct loss of 320 ha ecologically significant dryland habitats and many of the species that utilise these habitats. The applicant has offered little offset or compensation for this effect

96. **Table 1** summarises my assessment of the anticipated level of effects of the project on terrestrial ecology and potential solutions. However, I consider this proposal will have adverse effects on indigenous biodiversity and ecosystems and that proposed mitigations will not fully address these effects. I recommend that alternative, less ecologically damaging options for new solar installation be explored elsewhere.

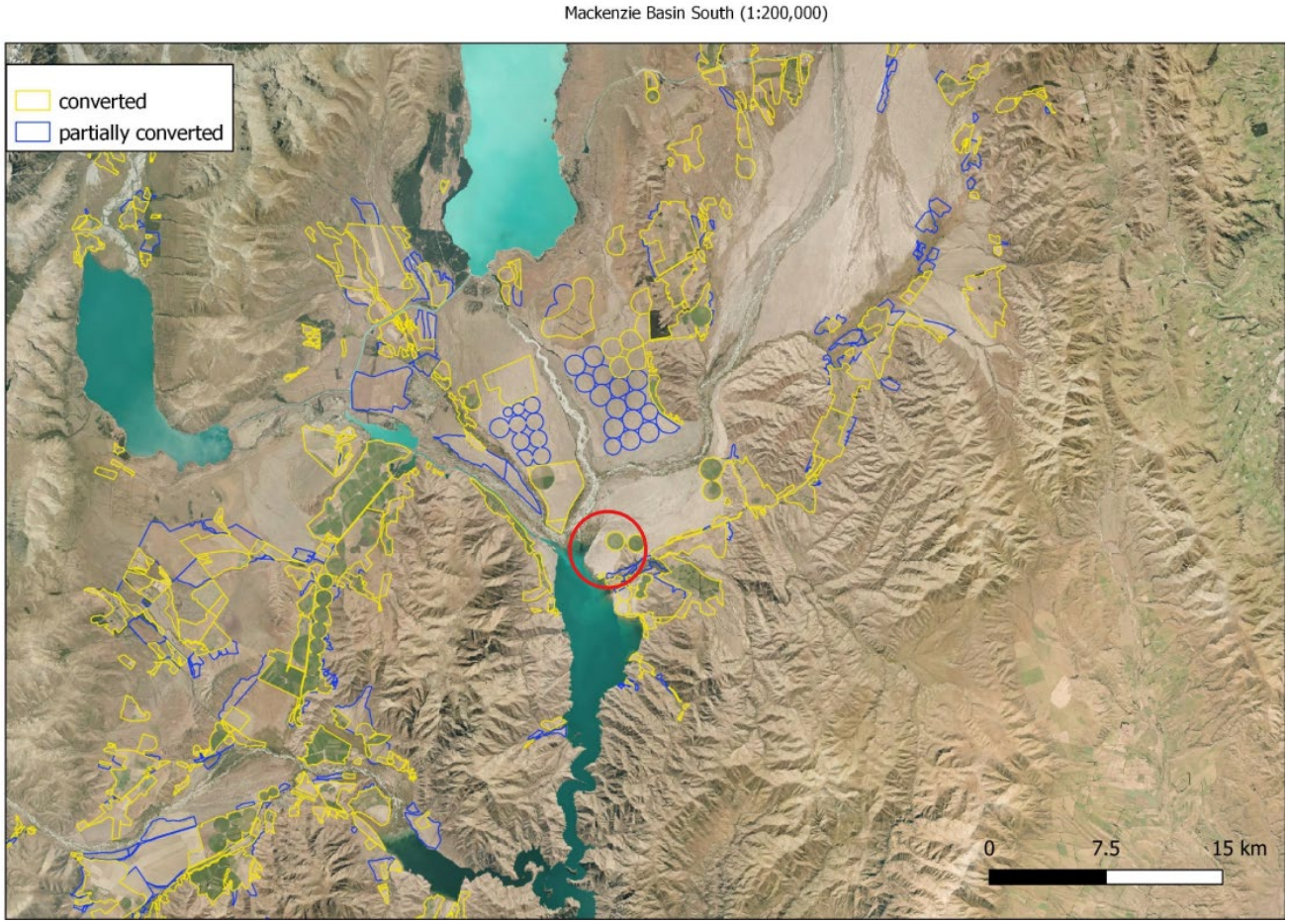
97. While the various potential impacts of the proposal may be low to moderate, they are significant and the cumulative and interlinked consequences of ongoing indigenous biodiversity losses in the Mackenzie Basin compounds adverse effects on remaining indigenous biodiversity.

98. Alternative locations for solar farm development should be considered. It has been suggested during the consideration of other solar developments in the Mackenzie Basin that areas of converted or partially converted land which meet definition of improved pasture, and canals or building surfaces might offer more appropriate locations for solar development in the Mackenzie as this would avoid the loss of significant indigenous vegetation and some habitats -albeit not address the potential risk of bird strike (**Attachment 1**) [42].

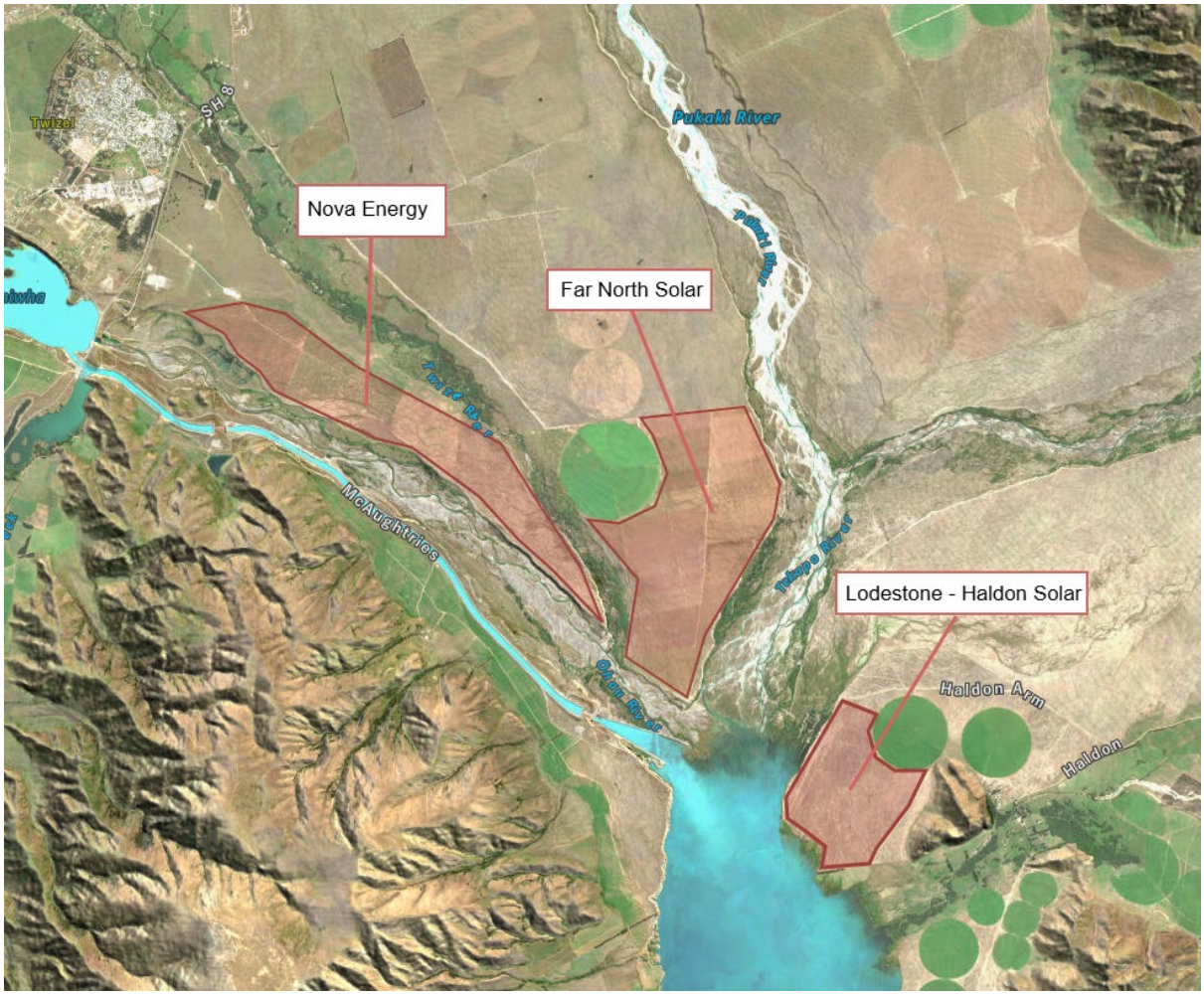
99. Proposed conditions relating to the management and monitoring of potential effects require the development of detailed plans and these should be reviewed by suitably qualified and experienced persons.

[42] See Harding, M. (2020). *Evidence – Attachment 3: Converted and Partially Converted Land, Mackenzie Basin*. Prepared for Mackenzie District Council, Plan Change 18 Indigenous Biodiversity Hearing available at: District Plan Changes and Consultation | Mackenzie District Council; and Walker, S. (2023, July 26). *Statement of evidence of Dr Susan Walker on behalf of the Mackenzie Guardians*. Evidence submitted to the Hearings Panel for applications CRC224567, CRC230898 (Environment Canterbury) & RM220048 (Mackenzie District Council) by A. W. & K. F. Simpson, 397 Braemar Road, Balmoral Station, Lake Tekapo, available at https://api.ecan.govt.nz/TrimPublicAPI/documents/download/4950304.

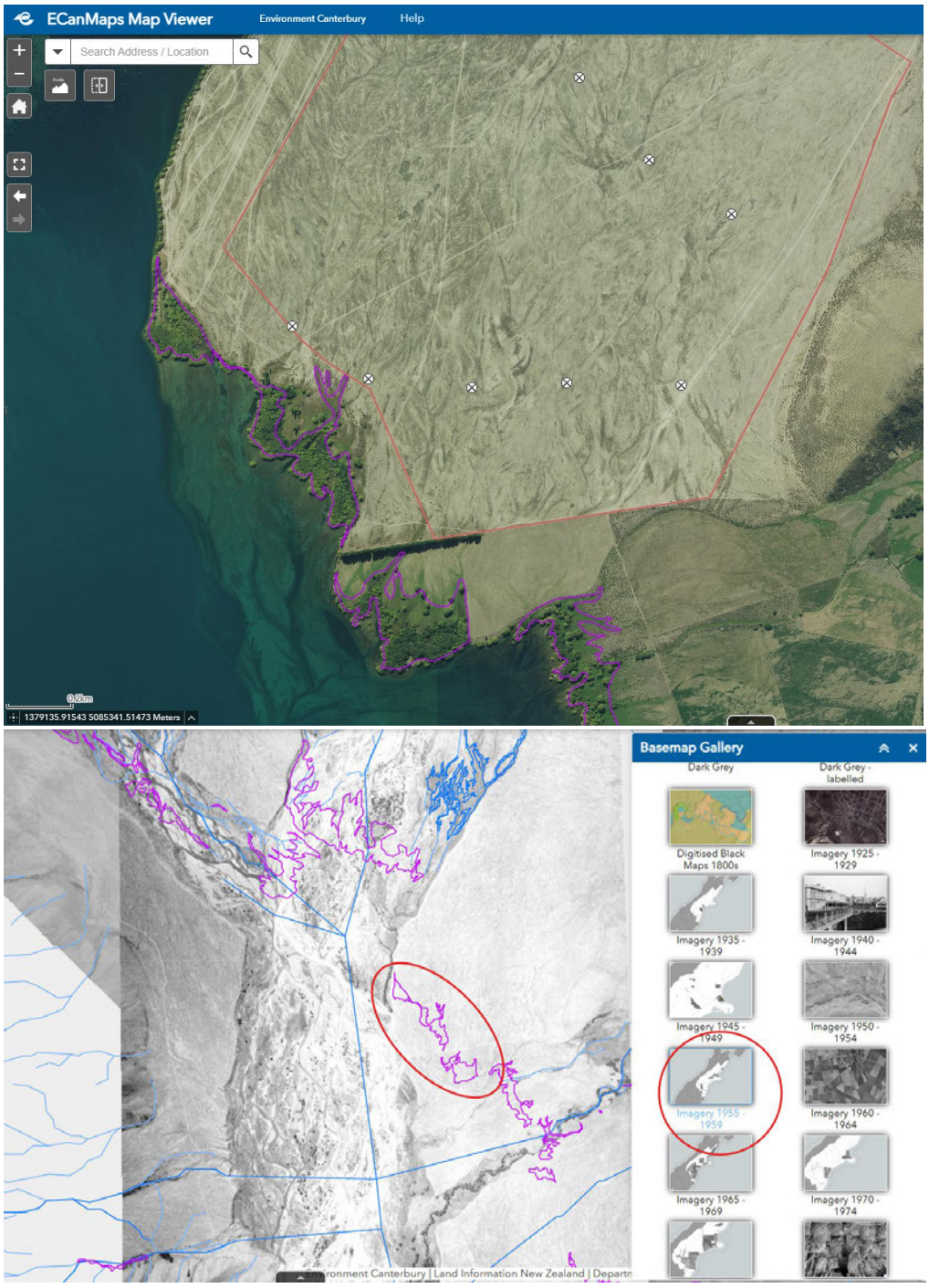
Attachment 1: Map below from Harding, M. (2020). Evidence – Attachment 3: Converted and Partially Converted Land, Mackenzie Basin. Prepared for Mackenzie District Council, Plan Change 18 Indigenous Biodiversity Hearing. Page 2 of 2. Available at https://www.mackenzie.govt.nz/__data/assets/pdf_file/0010/516655/Harding-Attachment-3.pdf The general location of the proposed site is circled in red (my annotation).



Attachment 2: Context of proposal with other nearby solar farm proposals Nova Energy and Far North Solar



Attachment 3: Indicatively mapped wetland extents adjacent to the proposal. Upper image shows the extent currently mapped by Environment Canterbury lying just outside the proposed footprint. Extents would not be considered to be natural inland wetland under the NPS-FM due to being induced by the construction of Lake Benmore (lower image shows the area was contiguous inland outwash gravels prior to construction. However, the area may provide habitat to indigenous fauna, offering suitable complexity of habitat to terrestrial species including invertebrates and lizards.



Attachment 4: Flight heat map of black fronted tern from Gurney (2022). The proposed solar farms occur directly under the hot spot of tern activity to the east, where the species is known to roost during evenings at the Tekapo Delta of Lake Benmore. I recommend that further consultation be undertaken with the Department of Conservation, particularly with their technical science advisors and ornithologists, to ensure the decision maker is fully informed of the potential effects on freshwater avifauna and appropriate management measures.

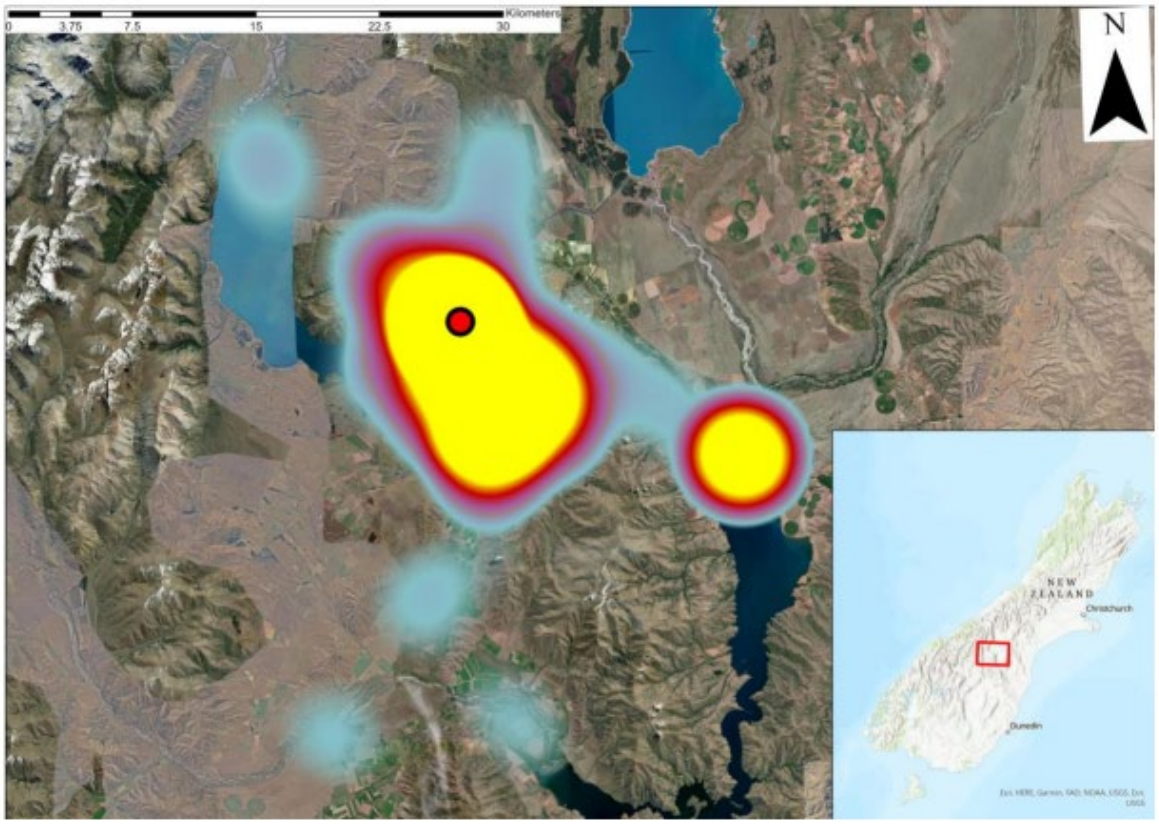
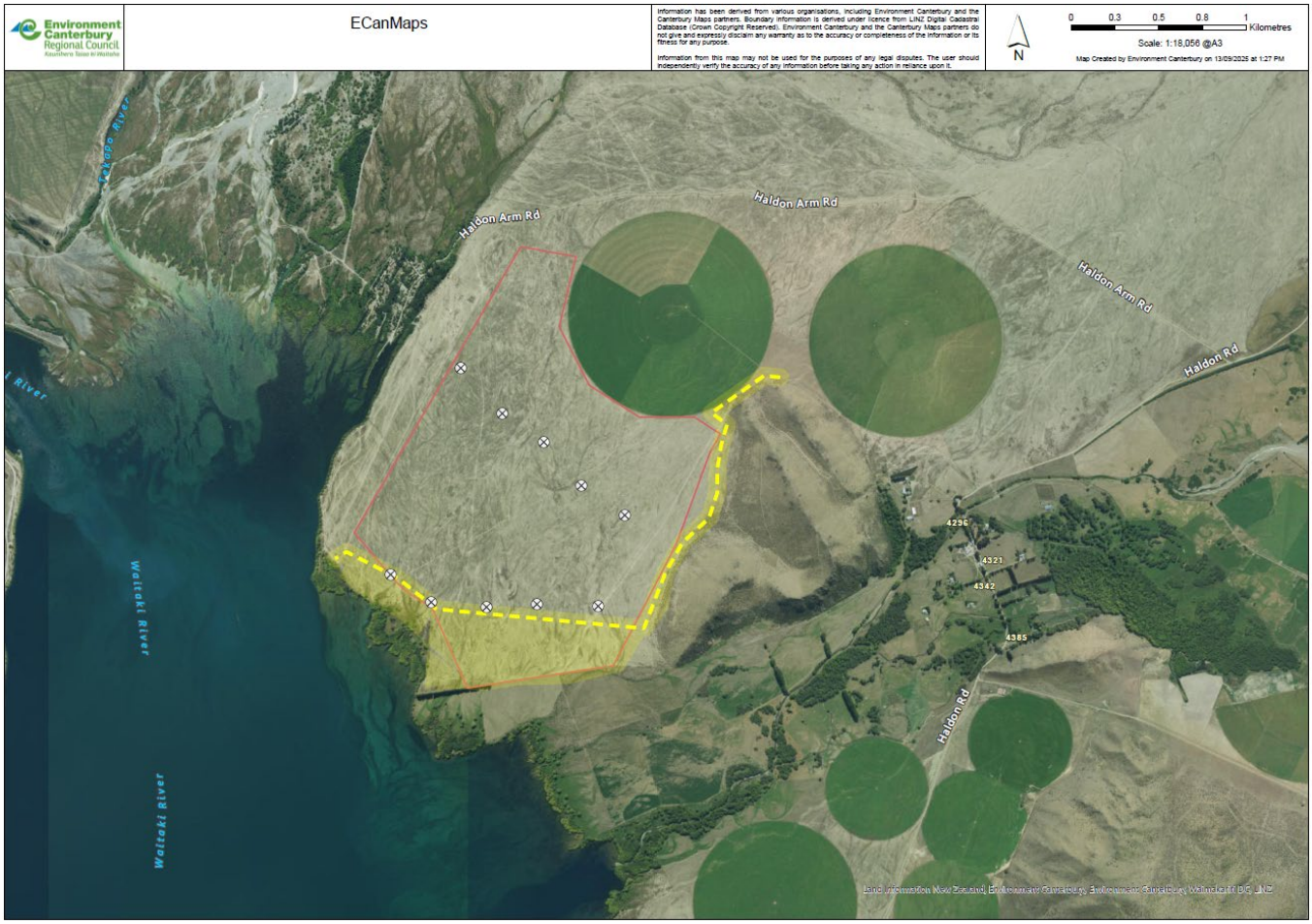


Figure 13: Heat map showing the density of GPS points from black-fronted terns from the Ohau Colony. The colours indicating density go from blue through to yellow, with blue being low density and yellow high density. The solid red circle is the Ohau colony, the right hand yellow cluster of high density GPS points is the roost at the Tekapo delta. Created in ArcGIS Pro.

Attachment 5: Consideration of lizard species potentially occurring at the site.

Common Name	Scientific Name	Threat Classification	Habitat Preference	Distance of closest record from the site	Likelihood of Presence on Site
McCann's skink	*Oligosoma maccanni*	Not Threatened	Open habitats – dry rocky environments such as rock outcrops and montane grassland.	3km	Likely: may be found in areas with dense grass.
Southern grass skink	*Oligosoma* aff. *polychroma* Clade 5	At Risk – Declining	Prefers damp or well vegetated habitats such as rank grasslands, wetlands, stream/river edges, and gullies. Widespread from Banks Peninsula to Stewart Island.	10km	Possible: may be found in areas with dense grass.
Southern Alps gecko	*Woodworthia* "Southern Alps"	At Risk – Declining	Rocky scrubland, talus, boulderfield, scree, stony river terraces and creviced rock outcrops (from lowland and montane valleys to alpine areas, <1,900 m).	2.5km	Possible: may be found in areas with dense grass and stoney substrates.
Jewelled gecko	*Naultinus gemmeus*	At Risk – Declining	Scrubland, forest and tussockland. Often trees and shrubs like beech, mānuka, kānuka, mingimingi, matagouri, snow tussock and other dense vegetation.	2.5km	Unlikely: little appropriate habitat (indigenous shrubland) appears on-site.
Scree skink	*Oligosoma waimatense*	Threatened – Nationally Vulnerable	Creviced rock bluffs, alluvial outwash plains, dry river cobbles and terraces, talus slopes, boulderfield and scree (from lowland to alpine areas, ≤1,500 m).	2.5km	Possible: potential habitat (tussock grassland, rock piles, low woody vegetation) at S & E edge of site.
Lakes skink	*Oligosoma* aff. *chloronoton* "West Otago"	Threatened – Nationally Vulnerable	Scrubland, tussockland, rocky areas, scree, herbfield, fellfield, stony riverbeds and terraces.	2.5km	Possible: potential habitat (tussock grassland, rock piles, low woody vegetation) at south and east edge of site. Although known south of Pukaki River, possibly occurs elsewhere.
Mackenzie skink	*Oligosoma* prasinum	Threatened – Nationally Vulnerable	Open grassy areas, rocky river terraces and tussock grasslands, scree, rock piles and fellfield habitats.	15km	Possible: potential habitat (open grassy areas, tussock, rock piles) available at south and east edge of site.

Attachment 6: Potential faunal habitats for lizards & invertebrates for which further survey effort is recommended (yellow highlight). Also shown: the approximate boundary of proposed solar array project footprint (red outline) and locations of the ten avifauna and lizard survey points of the Ecology Report (black-white cross). Much of the potential habitat lies outside the proposed footprint. It is recommended potential habitat is surveyed and or potential habitat is avoided, including the active exclusion of the areas from any construction activities.



APPENDIX 3 – CONTAMINATED LAND TECHNICAL ADVICE

From: Hannah Mirabueno – Canterbury Regional Council Contaminated Land and Waste Senior Scientist

From: Hannah Mirabueno [redacted]
Sent: Friday, 12 September 2025 9:51 am
To: Reuben Herz-Edinger [redacted] Jean Jack [redacted] Matt Riddle [redacted] Kate Bailue [redacted] Rachel Tutty [redacted]
Cc: Anna Stewart [redacted] nz>; David Sluter [redacted] Amanda Thompson [redacted] nz>; Daniel Clark [redacted]
Subject: RE: Fast-Track Request - Lodestone Energy DUE 12/9/25 - RMA251941

Hi Reuben

1. A landfill is noted adjacent to the application site. There is a possibility that the application site could encroach in the landfill footprint. Thus, the applicant has missed assessing the potential risk from the landfill that may impact the application site. The polygon for the landfill extent in the LLUR is indicative only. This can be addressed as a consent condition by requiring a preliminary site investigation (PSI) report. If a HAIL site is identified on the site by a PSI, a detailed site investigation, remedial action plan and site validation report could be required prior to start of works.

2. There was no assessment provided in terms of potential HAIL across the wider application site i.e. a preliminary site investigation that may be present in the application site. As there will be anticipated earthworks over a large area to prepare the site, including access roads, the construction of substation etc., there should be as a minimum an assessment of potential contamination/HAIL that may be present within the application site. While some assessment on HAIL has been made, it was highly reliant on the LLUR. However, the LLUR does not hold a complete record of activities that were undertaken on the site. It is only through a preliminary site investigation (PSI) that the potential for the presence or absence of HAIL sites can be ascertained. For a site that is adjacent to several rivers, it is important that the site is assessed for potential contamination prior to earthworks commencing on the site. I suggest the submission of a PSI report be part of the consent conditions. If HAIL site is identified on the site by a PSI, a detailed site investigation, remedial action plan and site validation report could be required. All investigation pertaining to contaminated land shall be undertaken by a suitably qualified and experienced practitioner (SQEP) in contaminated land. Can we please add this as a consent condition?

3. In the ESCP, it was mentioned that a substation platform and power stations will be constructed. This will involve the placement of 26,000m3 of imported fill. It was not assessed in the AEE or elsewhere what the composition of this fill material will be. I suggest requiring the fill to consist of cleanfill as per the definition in the Technical WasteMINZ Guideline (2023) or meeting the adopted values for Controlled fill in Table C-3 of the Technical WasteMINZ Guideline (2023).

4. A Site Management Plan (SMP) is proposed that include a representative soil sampling regime to monitor for the potential discharge of any contaminants not authorised by this

resource consent (Conditions 9 and 10 of Discharge permit – to discharge Operational Stormwater to Land).

There are also proposed conditions around soil monitoring in the land use consent (Consent conditions 22-26). Please seek clarification from the applicant of the intent to have two separate monitoring conditions.

5. For the purpose of monitoring the potential long-term effects to the soil from the activity (i.e. potentially contaminating the soil), conditions 22-26 in the land use consent have sufficiently included appropriate details such as soil monitoring parameters, distribution, frequency and reporting. I am happy with the approach that monitoring will be undertaken by a suitably qualified and experienced practitioner in soil health. The proposed conditions related to monitoring included target limits and some corresponding remedial action should the limits are exceeded. However, I would like to confirm that they will use the adopted values of Table C-3 for Controlled fills of the Technical Guideline for Disposal to Land (WasteMINZ, 2023). Please note that of the proposed analytes to be monitored only Cd, Cu , Pb and ZN have trigger concentrations. Please ask the applicant to provide trigger limits/concentrations in soil for silver, antimony and PFAS .

Contaminant	**Trigger concentrations (mg per kg)**
Cadmium	0.8
Copper	220
Lead	160
Zinc	190

6. Whilst there are some proposed corresponding remedial action for when exceedances occur, there are no clear remedial actions proposed. Thus, the applicant should provide a proposal for remedial actions that ECan can review and approve.

7. Should HAIL sites are identified, these sites may require remediation. remediated the SMP should also included mitigation and management measures on contaminated land to minimise discharges during construction phase.

8. This is a relatively big solar farm, so I expect substantial wastes to be generated. There is no information provided e.g. a plan for the end-of-life disposal of solar farm components. It may be included in the decommissioning management plan (DMP).
9. Proposed additional conditions for proper management of wastes:
    - End of life solar farm panels and any other associated wastes shall be taken to consented e-waste collection points or solar PV recycler, or if not recyclable should be disposed to a consented landfill whose waste acceptance criteria would be met.

Regards
Hannah

APPENDIX 4 – LAND RESOURCES SCIENCE TECHNICAL ADVICE

From: Matt Riddle – Canterbury Regional Council Land Resources Science: Team Leader

From: Matt Riddle [redacted]
Sent: Friday, 12 September 2025 9:36 am
To: Reuben Herz-Edinger [redacted]
Cc: Hannah Mirabueno [redacted]; Kate Bailue [redacted]
Subject: RE: Fast-Track Request - Lodestone Energy DUE 12/9/25 - RMA251941

Hi Reuben,
Here are my comments,
Cheers
Matt

- As mentioned in the AEE the soils are not Highly Productive Land (HPL), and the agricultural value of the site is relatively low in its current state. However, there are areas close by that do have centre pivot irrigation, which will increase productivity. Therefore, there is still value in this land and therefore rehabilitation post removal of the solar array structures is also important.

- I agree that due to the well-draining soils, there is low likelihood that there will be generation of significant runoff from the solar array area once the structures are installed and pasture species are established.

- There should be checks following re filling of trenches to make sure they have not sunken and created flow pathways which could result in surface runoff and erosion.

- During the construction phase, earthworks carried out could result in runoff due to soil compaction from heavy machinery. However, I consider the mitigations outlined in the erosion and sediment control plan (ESCP) are satisfactory to reduce the risk of runoff from most rainfall events.

- I consider stormwater production during the operational phase, not to be an issue for production of surface runoff.

- The suggested setback from Lake Benmore is a minimum of 200 m, this should be adequate for minimising risk of any construction phase and operational phase stormwater/sediment runoff reaching the lake. I would suggest that dense ground vegetation is encouraged in this set back zone to maximise filtration of any surface runoff from the site.

- In the AEE it states that "*Lodestone Energy will ensure the disturbed ground is appropriately rehabilitated following the completion of the works*" It is also suggested that a decommissioning plan will be developed 12 months prior to the actual decommissioning. I would like to see a draft of what this plan would look like before consent is given, so there are no surprises when the actual plan is produced.

Specifically, what is actually meant by restoration of disturbed land and what would that look like?

- Will there be any grazing on the site to control grass growth? Or how will the site be managed for long grass and therefore fire risk?

- Wind erosion is a potential for the site, however there is increased shading under the panels which may increase soil moisture and therefore plant growth during summer. Exposed soil will be prone to both wind and rainfall-based erosion and will therefore require planting with relevant species, be that native grasses or exotic, to stabilise the soil. There is mention that post cable trenching and for soil stabilisation in general, there will be revegetation through seeding and mulching or aggregate cover to reduce sediment generation. It would be good to get additional conditions around evaluating revegetation after a period of 2, 6, 12 months post completion of installation to make sure there is no bare soil from the excavations remaining over the site. It would also be prudent to maximise the drier periods of the year for when most excavation takes place.

- There is no mention of what will happen with the stripped fill from the substation earthworks etc. Will this be removed from site, stockpiled for the rehabilitation stage, or levelled out over the surrounding area? I would encourage it is left on site for future rehabilitation.

- The site is located right next to Lake Benmore which could indicate potential for any contaminants from the operational stage could potentially enter groundwater and then enter the lake, should there be connectivity there. This includes those contaminants to be analysed in soil, outlined in condition 23b.

- Consent condition 22-29 regarding soil monitoring is very thorough. I think this and the Stormwater Management Plan condition 9.c in the Discharge Permit – to Discharge Operational Phase Stormwater to Land could be joined together into one programme as follows:

    a) An initial soil survey before commencing works on site as stated in conditions 22-29. The site could be divided into 3 sections (~110 ha each). 50 sub samples per section are taken at 0-7.5 cm and each section is bulked together and a sample analysed for:
        i. pH
        ii. Electrical Conductivity
        iii. Silver
        iv. Cadmium
        v. Copper
        vi. Lead
        vii. Antimony
        viii. Zinc
        ix. Per-fluorinated compounds (PFAs)

    (b) At 3 sub sites within each of the 3 sections, to a depth of 7.5 cm the following are analysed:
        i. bulk density
        ii. aggregate stability

    (c) 5 years after installation repeat sampling as in (a) above.

(d) At 10 years post installation repeat as in (a) above.
(e) If values returned in (d) are below recommended limits, then extend sampling intervals to 10-year intervals.
(f) If any values returned in (d) are above guideline limits, a **mitigation plan**[1] is required to reduce those concentrations which have exceeded the limits. Repeat sampling as for (c) at 5-year intervals.
(g) At cessation of the consent period and before removal of the solar arrays, repeat the sampling outlined in (a). Once the site has been rehabilitated repeat the sampling in (b) to ensure a similar soil quality as at the start of the consent period.

Notes for mitigation plan[1]:
-There is currently no mitigation plan if guideline soil concentrations are exceeded at any point during the consent duration. I suggest a general mitigation plan should be produced before consent is granted, outlining the procedures that will be followed, should any exceedances occur.
General notes for sampling:
- 5 and 10-yearly sampling should be undertaken directly under the driplines to determine if there is any contamination coming from the panels themselves.
- Sampling locations should be marked by GPS to allow for re sampling at the same locations at follow up visits.

- Condition 26 suggests that compliance should view the Soil Monitoring Plan 20 working days prior to the commencement of any physical works. I would like the Land Resources Team to be included in the list of teams to be required to view this plan.

- Condition 27 focuses on after the works are completed. I would like an additional condition that requires the consent holder to revisit the site after 6 months (or closet practical time) to ensure vegetation has established and there is canopy closure. If any slumping of soil in excavated areas has occurred, this should then be re filled.

- As the groundwater depth is uncertain and with potential for driven structural piles to intercept groundwater, there is risk that artificial macropores are created when driving these piles through stony soil. These pores are therefore an expressway for surface contaminants to get to groundwater. I would suggest that there are checks made to ensure the soil has sealed around the piles at the time of insertion and also after a period of 6 months post installation to check for any slumping of the soil recreating further macropores.

- Removal of the piles when site rehabilitation occurs at the conclusion of the consent period could also create large macropores as identified above. To prevent this, the pile holes should be re filled with soil sourced from the site and replaced at a bulk density that is as close as possible to that at the site's establishment.

APPENDIX 5 – GROUNDWATER TECHNICAL ADVICE

From: Kate Bailue – Canterbury Regional Council Groundwater Resources Senior Scientist

Table 1. Technical Advice Summary				
Technical Team	**Canterbury Regional Council technical expert considers all expected technical reports are provided**	**Canterbury Regional Council technical expert has identified gaps in the provided technical reports**	**Canterbury Regional Council technical expert considers the conditions are appropriate**	**Comments (Key Findings & Concerns)** **[*Consent Planner clarifying comments*]**
Consent Planning	*Yes – All required consents applied for.*			*Assessments against CRPS and LWRP*
Groundwater (quantity)	*Yes – AEE provides a basic description of groundwater, but it lacks a specific discussion on the effects of the proposed activities on groundwater.*	*No onsite assessment of onsite groundwater levels. Desktop analysis only using CRC's existing wells, which are not located in optimal locations.* *No detailed Geotech assessment Dewatering may be required to lay cables.*	*The applicant classifies the **dewatering** as a permitted activity (Rule 5.119). This is likely the case, but there are a few areas that are not completely covered off.* - *Are the excavations outside the HAIL?* - *What is the expected dewatering rate given the sub-surface conditions?* - *Can the discharge meet LWRP TSS limits?* - *How close to Lake Benmore will the dewatering occur?*	*The application lacks detail on the nature of the earthworks.* *The applicant has mentioned that groundwater may be intercepted as cables are buried 2.5 m below ground level. Therefore, minor dewatering may be required. There is a lack of detail around the scale of the dewatering required.* *Operational stormwater will have stormwater soakage pits for associated buildings. There is no detail on the design to*

			Excavations over aquifers *Relevant conditions* - Accidental Artesian Aquifer Interception	*determine if they will intersect groundwater.* *The aquifer is considered unconfined or semi-confined and therefore unlikely to intercept artesian aquifer conditions.*
Groundwater (quality)	*Yes – AEE provides a basic description of groundwater, but it lacks a specific discussion on the effects of the proposed activities on groundwater.*	*No onsite assessment of groundwater quality to establish baseline groundwater quality.*	***Construction phase stormwater*** *(to land)* Relevant proposed conditions - ESCP plan - Spill management - *Visual monitoring of the discharge for contaminants (oil or grease)* - *Disturbed areas stabilised and/or re-vegetated* ***Excavations over aquifers*** *Relevant conditions* - ESCP plan - Accidental discovery of contaminants - Spill management **Operational phase stormwater** (to land) Relevant proposed conditions: - *Stormwater management plan including details of Soil*	Unsure if excavations are potentially over HAIL (landfill site) No details on the expected contaminants in the operational stormwater discharge. Particularly near the substation and buildings. Galvanised steel piles will be installed from 1.5 to 3 m below ground level. Shallow groundwater can be as high as ground level. There is a long-term risk of zinc potentially leaching to groundwater from the galvanised steel piles. Any contaminants that find their way to groundwater are

			monitoring (soil health, metals, PFAS) - *Spill management* - *ESCP plan*	likely to flow to Lake Benmore. The risk would depend on the nature of the galvanised steel piles and the number. *Maintenance schedule of the solar panels. Any cleaning detergents proposed?*

APPENDIX 6 – PLANNING TECHNICAL ADVICE

From: Rachel Tutty – Canterbury Regional Council Principal Planner

Response to questions:

1. Are all the technical reports we would expect to see for this sort of application have been provided by the applicant – if not, what is missing?
   - Cultural impact assessment
   - Liquefaction risk assessment
   - Ecological Management Plan
2. Are there any gaps in the technical reports that have been provided, and if so, what is missing?
   - There is no consideration of the cumulative effects of solar farm development in the area (Haldon, Twizel, The Point, Grampians). This should definitely be taken into account in transport and landscape assessments and when considering where workers will be accommodated. Of particular concern is the effects on State Highway 8 if construction is taking place concurrently at different sites, and impacts on Haldon Road if the Grampians and Haldon Solar farms are under construction simultaneously.
   - Little information has been provided on the current use of the site and whether the land will continue to be used for grazing once the solar array has been constructed. This lack of information makes it difficult to determine the effects of the proposal on the productive use of the land.
   - Unlike the proposals for other solar arrays in the area, no plans have been provided for any ecological restoration at the site. Restoration and enhancement of indigenous biodiversity, particularly in the margins of the adjacent waterbodies, would assist the project to comply with RPS objectives and policies.
3. If the technical report relies on sufficient or appropriate data/ investigation/ survey for your relevant area of expertise?
   - The flood hazard assessment supplied has not identified high hazard areas at the site using the 1 in 500 year flood event criteria required under the RPS and recommended by Canterbury Regional Council technical experts.
4. If the draft conditions are appropriate.
   - Do you have any concerns, please explain basis for those.

- Unlike the proposals for other solar arrays in the area, no plans have been provided for any ecological restoration at the site. Restoration and enhancement of indigenous biodiversity, particularly in the margins of the adjacent waterbodies, would assist the project to comply with RPS objectives and policies.

o If only minor changes needed and you can suggest them, please do.

- Are there gaps in proposed mitigation management/ missing conditions to manage effects?

Summary

Table 1. Technical Advice Summary				
Technical Team	**Canterbury Regional Council technical expert considers all expected technical reports are provided**	**Canterbury Regional Council technical expert has identified gaps in the provided technical reports**	**Canterbury Regional Council technical expert considers the conditions are appropriate**	**Comments (Key Findings & Concerns)** **[*Consent Planner clarifying comments*]**
Planning	*Additional reports required:* • *Cultural Impact Assessment* • *Liquefaction Risk Assessment* • *Ecological management Plan*	*Gaps identified:* • *No consideration of cumulative effects of solar farm developments in the area – needs to be taken into account in landscape and transport assessments and when considering where workers will be accommodated.* • *Little information has been provided on the current use of the site and whether the land*	• *Unlike the proposals for other solar arrays in the area, no plans have been provided for any ecological restoration at the site. Restoration and enhancement of indigenous biodiversity, particularly in the margins of the adjacent waterbodies, could be included as a consent condition. Such activities would*	*RPS:* *Further details are included in the following document which should be attached as an appendix to the response.* Haldon Solar project response.docx *The main points in the assessment are:* • *The project would enable people to provide for their economic and social well-being but further information is required to determine effects on cultural well-being. The site lies within an identified Site of Significance to Māori and is adjacent to*

		will be grazed once the solar array has been constructed. • *Unlike the proposals for other solar arrays in the area, no plans have been provided for any ecological restoration at the site. Restoration and enhancement of indigenous biodiversity, particularly in the margins of the adjacent waterbodies, would assist the project to comply with RPS objectives and policies.* *Also in regards to whether a technical report relies on sufficient or appropriate data –* • *The flood hazard assessment supplied has not identified high hazard areas at the site using the 1 in 500 year flood event criteria required under the RPS and recommended by Canterbury Regional Council technical experts.*	*give better consistency with RPS Chapter 9 objectives and policies.* • *A condition could be included requiring that access to and along the Tekapo River and Lake Benmore should be provided.*	*Lake Benmore which is a Statutory Acknowledgement Area.* • *The project would increase the sustainability and reliability of New Zealand's electricity supply, however the Mackenzie Basin already supplies a significant amount of New Zealand's electricity and greater diversification of location would be desirable, especially locating generation closer to major users such as urban areas.* • *The project site is in close proximity to the existing national grid and is sited in an area of high sunlight and on level land. This makes the site suitable for solar electricity generation so long as adverse effects can be managed.* • *The project is within the Mackenzie Basin Outstanding Natural Landscape. A landscape assessment has been provided which identifies the likely impacts on landscape values, but no mitigation measures have been proposed, and cumulative effects of several solar farms in close proximity have not been considered.* • *Unlike in other similar proposals, no plans have been provided for ecological enhancement of the riparian margins of adjacent waterbodies, including Lake Benmore which is identified as a Site of Natural Significance in the Mackenzie District Plan.* • *There are some risks from natural hazards at the site:*

				○ *The site lies within the Flood Hazard Assessment Overlay in the Mackenzie District Plan. Although a flood assessment has been provided by the applicant, it does not use the 1 in 500 year modelling required under the RPS.* ○ *Part of the site is covered by the Hydro Inundation Overlay. No assessment of risk has been provided.* ○ *Part of the site is also covered by the Liquefaction Assessment Overlay. No assessment of risk has been provided.* • *The project would at least partially foreclose the use of the land for primary production. More information is needed on the current use of the land and whether grazing will continue once the solar array is in place.* • *Further information is needed on how pest species, including wilding conifers, will be managed at the site.* • *An old landfill has been identified close to the site. Further information on how potentially contaminated land will be managed is needed in order to determine compliance with the RPS.* • *Given the size of the site, and provided good construction management techniques are adhered to, dust and nuisance effects should be managed*

				appropriately so that it is not a danger to people's health and safety. • *It is likely that the site will contain areas where hazardous substances are stored. Provided this storage occurs in accordance with relevant legislation and it carried out appropriately, it is considered that the proposed activity would be consistent with this policy.* • *Further information is needed to determine how public and Ngāi Tahu access to and along the Tekapo River and Lake Benmore might be affected by the proposal.*

Appendix 1: Consistency with Canterbury Regional Policy Statement (CRPS)

Relevant definitions in the CRPS:

Definition	Relevance to the Haldon Solar project proposal
Critical Infrastructure *Infrastructure necessary to provide services which, if interrupted, would have a serious effect on the communities within the Region or a wider population, and which would require immediate reinstatement. This includes any structures that support, protect or form part of critical infrastructure. Critical infrastructure includes:* 1. *regionally significant airports* 2. *regionally significant ports* 3. *gas storage and distribution facilities* 4. *electricity substations, networks, and distribution installations, including the electricity distribution network* 5. *supply and treatment of water for public supply*	The new substation and additional tower would be covered under the definition of critical infrastructure, as would the existing national grid towers and lines that cross the site. State Highway 8 is also critical infrastructure, and while it is not adjacent to the site, the construction materials will be transported along it, as will construction workers. It is proposed that the intersection between State Highway 8 and Haldon road would need to be upgraded to accommodate the heavy vehicles involved.

6. *storm water and sewage disposal systems* 7. *telecommunications installations and networks* 8. *strategic road and rail networks (as defined in the Regional Land Transport Strategy)* 9. *petroleum storage and supply facilities* 10. *public healthcare institutions including hospitals and medical centres* 11. *fire stations, police stations, ambulance stations, emergency coordination facilities.*	
Electricity transmission network *The electricity transmission network/ electricity transmission activities/ assets/ infrastructure/ resources/ system, all being part of the national grid of transmission lines and cables (aerial, underground and undersea, including the high-voltage direct current link), stations and sub-stations and other works used to connect grid injection points and grid exit points to convey electricity throughout the North and South Islands of New Zealand.*	The new substation and additional tower would form part of the electricity transmission network, as do the existing national grid towers and lines that cross the site.
Essential Structures *Structures that support or form part of:* *1. a maritime, road or rail transport network or service;* *2. water supply, including irrigation infrastructure;* *3. a telecommunications or radio-communication network;* *4. an energy generation, supply or transmission facility or network;* *5. a flood-protection work or facility;* *6. water containment, flow or diversion infrastructure;* *7. a water level or flow-measurement facility;* *8. a drainage or sewerage system; or* *9. the infrastructure forming parts of other network utilities. This includes any structures that support essential infrastructure.*	The proposed solar arrays, substation, inverters, batteries and new towers would qualify as essential structures under 'energy generation, supply or transmission facility or network', as would the existing towers and lines that cross the site. The supporting infrastructure (related to the proposal that wouldn't fall under clause (4) of the definition) would be captured by clause (9) of the definition.
Hazardous activity or industry *An activity or industry that appears on the Hazardous Activity and Industry List (HAIL) 2004. The HAIL is published as Schedule A in the Contaminated Land*	The HAIL includes: *B – Electrical and electronic works, power generation and transmission*

Management Guidelines - Ministry for the Environment (2004) updated September 2007.	1. *Batteries including the commercial assembling, disassembling, manufacturing or recycling of batteries (but excluding retail battery stores)* 2. *Electrical transformers including the manufacturing, repairing or disposing of electrical transformers or other heavy electrical equipment* 3. *Electronics including the commercial manufacturing, reconditioning or recycling of computers, televisions and other electronic devices* 4. *Power stations, substations or switchyards* The proposal would include HAIL activities.
High hazard area *High hazard areas are:* *1. flood hazard areas subject to inundation events where the water depth (metres) x velocity (metres per second) is greater than or equal to 1 or where depths are greater than 1 metre, in a 0.2% annual exceedance probability flood event;* *...* *When determining high hazard areas, projections on the effects of climate change will be taken into account*	The project site lies within the Flood Hazard Assessment Overlay identified in the Mackenzie District Plan. While a flood hazard assessment has been carried out and included in the application materials, this has not identified high hazard areas at the site using the 1 in 500 year flood event criteria required under the RPS and recommended by Canterbury Regional Council technical experts. An updated assessment should be provided by the applicant.
Historic cultural and heritage landscapes *A landscape that has:* 1. *significant historic cultural value arising from a relationship or association between people and the environment, or beliefs about them; and/or*	The entire site lies within the Tauwharekura / Grays Hills kāinga / Mahika Kai Area. This area was a traditional place where ancestors used to work and holds the memories, stries and traditions of rūnaka tupuna.

2. *significant historic heritage value that forms a cohesive and collective record of the history of an area.* *Such a landscape may include linkages, networks and nodes that are integral to its values. Such values may be tangible or intangible.*	The site is close to Te Pā-o-Kāti- Kurī / Mount Maggie Mountain range which is a kāinga Mahika kai where weka, tuna and kōareare were gathered during the seasonal and annual trips to Te Manahuna / Mackenzie Basin. The site is also close to Te Ao Mārama / Lake Benmore which is a statutory acknowledgement area. This is because it overlays the path of the Waitaki River which is highly significant for Kāi Tahu.
Margin *Land immediately adjacent to the bed of a river, wetland, lake or estuary which is likely to be affected by a high water table, flooding, fluvial erosion, or sediment deposition, and often contains significant vegetation. The size of the margin will vary according to local site factors but may extend to the limits demarcated by natural river terraces and constructed stopbanks.*	The site is bounded by Te Ao Mārama and the Takapō River, although it is set back at least 200m from those waterbodies.
Primary production *The production (but not processing) of primary products including agricultural, horticultural, pastoral, aquacultural, and forestry products and includes the use of land and auxiliary buildings for these purposes.*	Little information has been provided on the current use of the land and whether the land will be grazed once the solar array has been constructed. This lack of information makes it difficult to determine whether the land is currently used for primary production and whether that will continue.
Regionally significant infrastructure *Regionally significant infrastructure is:* 1. *...* 6. *National, regional and local renewable electricity generation activities of any scale* 7. *The electricity transmission network*	The Haldon Solar project would be considered regionally significant infrastructure.

8. …. *14. Electricity distribution network* *15. Infrastructure defined as 'strategic infrastructure' in this regional policy statement. Note: For the avoidance of doubt, this infrastructure is also referred to as 'infrastructure that is regionally significant'.*	
Renewable Electricity Generation *The generation of electricity from solar, wind, hydro electricity, geothermal, biomass, tidal, wave, or ocean current energy sources.*	The Haldon Solar project is renewable electricity generation.
Renewable electricity generation activities *The construction, operation and maintenance of structures associated with renewable electricity generation. This includes small and community-scale distributed generation activities, the system of electricity conveyance required to convey electricity to the distribution network and/or the national grid, and electricity storage technologies associated with renewable electricity.*	The Haldon Solar project is a renewable electricity generation activity.
Riparian zone *In relation to a river or lake the riparian zone is the area of land within their beds and adjacent to the beds where direct interaction occurs between aquatic and terrestrial ecosystems. The riparian zone includes the banks of a river and the margin of a lake. Wetlands and islands may also be part of the riparian zone.*	The Haldon Solar project site is adjacent to the Takapō River and Lake Benmore. The riparian zones of those waterbodies will need to be protected from adverse effects. The proposed activities are set back from those waterbodies by at least 200m.
Undeveloped *Within the context of the high country, this means areas where there has been no significant ongoing or regular addition of fertiliser, cultivation, oversowing or direct drilling with introduced pasture plants.*	More information is needed on the current land use in order to determine whether the land should be considered undeveloped.
Versatile Soils *Land classified as Land Use Capability I or II in the New Zealand Land Resource Inventory.*	The site is not identified as Land Use Capability I or II. As such it does not meet the definition of versatile soil.

Objective and Policy Assessment:

Objective/ Policy	Assessment
Chapter 5 – Land Use and Infrastructure	
Objective 5.2.1 **Location, Design and Function of Development (Entire Region)** Development is located and designed so that it functions in a way that: 1. achieves consolidated, well designed and sustainable growth in and around existing urban areas as the primary focus for accommodating the region's growth; and 2. enables people and communities, including future generations, to provide for their social, economic and cultural well-being and health and safety; and which: a. maintains, and where appropriate, enhances the overall quality of the natural environment of the Canterbury region, including its coastal environment, outstanding natural features and landscapes, and natural values; b. provides sufficient housing choice to meet the region's housing needs; c. encourages sustainable economic development by enabling business activities in appropriate locations; d. minimises energy use and/or improves energy efficiency; e. enables rural activities that support the rural environment including primary production; f. is compatible with, and will result in the continued safe, efficient and effective use of regionally significant infrastructure; g. avoids adverse effects on significant natural and physical resources including regionally significant infrastructure, and where avoidance is impracticable,	1. Renewable Electricity Generation closer to existing urban areas, where the bulk of the electricity is used would give better effect to this objective. 2. The project would enable people and the community to provide for their social and economic well-being, by providing employment opportunities as well as a more resilient electricity supply. Further information is needed to determine the effects of the proposal on cultural well-being, especially in terms of effects on landscape values, and indigenous biodiversity. Further engagement will need to take place with manawhenua, and a cultural impact assessment undertaken, to ensure that effects on cultural values are minimised. a. The project is located within an Outstanding Natural Landscape and will have an impact on the values of that landscape and other natural values. Cumulative effects on landscape values arising from several solar array proposals in close proximity to each other will be more significant than the effects identified for this project alone. Lake Benmore is identified as a Site of Natural Significance in the Mackenzie District Plan. Unlike in other similar proposals, no plans have been provided for ecological enhancement of the riparian margins of adjacent waterbodies. Restoration of those areas as part of the proposal would better give effect to this objective.

remedies or mitigates those effects on those resources and infrastructure; h. facilitates the establishment of papakāinga and marae; and i. avoids conflicts between incompatible activities.	e. The proposal is taking place on rural land, meaning that the ability to undertake rural activities on the same site is diminished, due to the presence of the structures. f. The proposal is compatible with regionally significant infrastructure, insofar as it is a generation activity located near existing transmission lines. The project can be efficiently connected to the network (i.e. the generated electricity would not need to be conveyed over a long distance to reach the network). Based on the information provided by the applicant, Transpower has been engaged with regarding the proposal. g. According to the landscape assessment report provided by the applicant, the proposal does not avoid effects on the outstanding natural landscape values, with the overall impact at a low-moderate level. Cumulative effects on landscape values arising from several solar array proposals in close proximity to each other will be more significant than the effects identified for this project alone. Lake Benmore is identified as a Site of Natural Significance in the Mackenzie District Plan. The proposed setbacks and consent conditions should mitigate any effects on the lake. i. There does not appear to be a conflict of activities, unless the use of rural land, for non-rural use is considered to be a conflict. The Haldon Solar project proposal is not entirely inconsistent with Objective 5.2.1 based on information provided at this point. If developed, the facility itself would be considered regionally significant infrastructure. However, further information is needed to determine if the proposal is consistent with this objective.

Objective 5.2.2 **Integration of Land-use and regionally significant infrastructure (Wider Region)** In relation to the integration of land use and regionally significant infrastructure: 1. To recognise the benefits of enabling people and communities to provide for their social, economic and cultural well-being and health and safety and to provide for infrastructure that is regionally significant to the extent that it promotes sustainable management in accordance with the RMA. 2. To achieve patterns and sequencing of land-use with regionally significant infrastructure in the wider region so that: a. development does not result in adverse effects on the operation, use and development of regionally significant infrastructure b. adverse effects resulting from the development or operation of regionally significant infrastructure are avoided, remedied or mitigated as fully as practicable. c. there is increased sustainability, efficiency and liveability.	1. The project does enable people and the community to provide for their social and economic well-being, by providing employment opportunities as well as a more resilient electricity supply. Further engagement will need to take place with manawhenua, and a Cultural Impact assessment undertaken, to ensure that effects on cultural values are minimised. If the solar array is built it would be regionally significant infrastructure. However, a more detailed proposal is needed to determine if this 'promotes sustainable management in accordance with the RMA' as per this Objective. 2. a. The project would be considered regionally significant infrastructure once built. The applicant has engaged with Transpower to ensure that the project is compatible with existing national grid infrastructure. b. The project is likely to have adverse effects on the landscape, ecological and cultural values of the site. Further consultation with manawhenua will be required to find ways to mitigate the effects of the proposal on cultural values. c. The project will increase the sustainability of New Zealand's electricity supply by providing more renewable electricity generation, which could replace some of our reliance on fossil fuels. The Haldon Solar project is not entirely inconsistent with Objective 5.2.2 based on information provided at this point. If developed, the solar array itself would be considered regionally significant infrastructure. However, further information is needed to determine if the proposal is consistent with this objective.

Policy 5.3.2 **Development Conditions (Wider Region)** To enable development including regionally significant infrastructure which: 1. ensure that adverse effects are avoided, remedied or mitigated, including where these would compromise or foreclose : a. existing or consented regionally significant infrastructure; b. options for accommodating the consolidated growth and development of existing urban areas; c. the productivity of the region's soil resources, without regard to the need to make appropriate use of soil which is valued for existing or foreseeable future primary production, or through further fragmentation of rural land; d. the protection of sources of water for community supplies; e. significant natural and physical resources; 2. avoid or mitigate: a. natural and other hazards, or land uses that would likely result in increases in the frequency and/or severity of hazards; b. reverse sensitivity effects and conflicts between incompatible activities, including identified mineral extraction areas; and 3. integrate with: a. the efficient and effective provision, maintenance or upgrade of infrastructure; and b. transport networks, connections and modes so as to provide for the sustainable and efficient movement of	1. a. The project would be regionally significant infrastructure once built. National Grid transmission lines which are also regionally significant infrastructure pass through the site and the applicant has engaged with Transpower to ensure that the development can be connected to those transmission lines. b. Renewable Electricity Generation closer to existing urban areas, where the bulk of the electricity is used would give better effect to this policy. c. The project site has not been identified as Highly Productive Land. Further information is needed as to whether the land would continue to be grazed once the solar array has been constructed. e. According to the landscape assessment report provided by the applicant, the proposal does not avoid effects on the outstanding natural landscape values, with the overall impact at a low to moderate level. 2. a. Parts of the project site have been included in the Hydro Inundation overlay for the Waitaki Power Scheme, and the whole site lies within the Flood Hazard assessment Overlay. The proposal is unlikely to increase the frequency or severity of natural hazards. Although a flood hazard assessment has been provided by the applicant, it has not been carried out using 1 in 500 year modelling as required under the RPS and has not adequately identified high flood hazard areas. An assessment should be carried out to determine whether any of the site constitutes a high hazard area for flooding, with inverters, the substation, and the temporary office avoiding any areas identified as such. The inverters and temporary office should also avoid the parts of the site identified in the Hydro Inundation overlay.

people, goods and services, and a logical, permeable and safe transport system.	b. The project could be considered to be incompatible with the nearby campsite. The use of rural land, for non-rural use is considered to be a conflict. 3. a. The proposal integrates well with existing electricity transmission infrastructure. b. the site access is off State Highway 8. During the construction phase especially, the use of that access by high numbers of vehicles could hinder the efficient movement of people, goods and services along that highway. Cumulative effects on that highway arising from the construction of several solar array proposals in close proximity to each other will be more significant than the effects identified for this project alone. The Haldon Solar project is not entirely inconsistent with Policy 5.3.2 based on information provided at this point. If developed, the facility itself would be considered regionally significant infrastructure. However, further information is needed to determine if the proposal is consistent with this policy.
Policy 5.3.9 **Regionally significant infrastructure (Wider Region)** In relation to regionally significant infrastructure (including transport hubs): 1. avoid development which constrains the ability of this infrastructure to be developed and used without time or other operational constraints that may arise from adverse effects relating to reverse sensitivity or safety; 2. provide for the continuation of existing infrastructure, including its maintenance and operation, without prejudice to any future decision that may be required for the ongoing operation or expansion of that infrastructure; and	3. a. Renewable Electricity Generation (REG) activities have logistical and operational constraints because they need to developed in locations where the electricity they produce can be connected to the national grid. Ideally generation activities should be sited close to where the electricity is used (mainly in urban centres) to minimise energy loss, but failing that, REG activities close to existing infrastructure such as the national grid make sense. Solar arrays also have particular locational requirements, in that they should be in areas with high amounts of sunshine, and on reasonably flat terrain. The proposed site fits those requirements.

3. provide for the expansion of existing infrastructure and development of new infrastructure, while: a. recognising the logistical, technical or operational constraints of this infrastructure and any need to locate activities where a natural or physical resource base exists; b. avoiding any adverse effects on significant natural and physical resources and cultural values and where this is not practicable, remedying or mitigating them, and appropriately controlling other adverse effects on the environment; and c. when determining any proposal within a sensitive environment (including any environment the subject of section 6 of the RMA), requiring that alternative sites, routes, methods and design of all components and associated structures are considered so that the proposal satisfies sections 5(2)(a) – (c) as fully as is practicable.	b. According to the landscape assessment report provided by the applicant, the proposal does not avoid effects on the outstanding natural landscape values, with the overall impact at a low to moderate level. Ecological effects management, such as habitat restoration and the implementation of management plans, is required to manage other potential ecological effects. c. The proposal is within a sensitive environment (Outstanding Natural Landscape, Lakeside Protection Area). It would be interesting to know whether alternative sites and methods have been considered. However, to determine site appropriateness, further information is needed on the values present at the site, and steps taken to avoid, remedy or mitigate any effects. This includes effects relating to: - the preservation of the natural character of the adjacent lake and rivers and their margins. - The protection of outstanding natural landscapes from inappropriate subdivision, use and development. - The protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna (Lake Benmore). - The relationship of Māori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga. - The management of significant risks from natural hazards, meaning that a hazards (including a more appropriate flooding) assessment should be undertaken. The Haldon Solar project is not entirely inconsistent with Policy 5.3.9 based on information provided at this point. If developed, the facility itself would be considered regionally significant

	infrastructure. However, further information is needed to determine if the proposal is consistent with this policy.
Policy 5.3.12 **Rural production (Wider Region)** Maintain and enhance natural and physical resources contributing to Canterbury's overall rural productive economy in areas which are valued for existing or foreseeable future primary production, by: 1. avoiding development, and/or fragmentation which; a. forecloses the ability to make appropriate use of that land for primary production; and/or b. results in reverse sensitivity effects that limit or precludes primary production. 2. enabling tourism, employment and recreational development in rural areas, provided that it: a. is consistent and compatible with rural character, activities, and an open rural environment; b. has a direct relationship with or is dependent upon rural activities, rural resources or raw material inputs sourced from within the rural area; c. is not likely to result in proliferation of employment (including that associated with industrial activities) that is not linked to activities or raw material inputs sourced from within the rural areas; and d. is of a scale that would not compromise the primary focus for accommodating growth in consolidate, well designed and more sustainable development patterns. and; 3. ensuring that rural land use intensification does not contribute to significant cumulative adverse effects on water quality and quantity.	1. a. The project would partially foreclose the ability of using the land for primary production. More information is needed on both the current use of the site and any intended grazing once the solar array has been constructed. b. The project would not result in reverse sensitivity effects that limits or precludes primary production. 2. The project would provide employment opportunities, especially during the construction phase. There is very little housing available in the vicinity of the site, so the impacts of this should be taken into account when considering the application. This is an issue that has not been adequately addressed in the application, so more information needs to be provided, particularly in the context of the cumulative impacts of constructing several solar farms in the vicinity. b. The employment is dependent on rural resources, namely the use of rural land. c. It is not considered, based on the available information, that the proposed activity would likely have significant cumulative adverse effects on water quality and quantity. Further detail would need to be provided in relation to availability of rural land, particularly improved pasture within the Mackenzie Basin, and if the use of this site for solar energy generation will impact the rural productive economy. Further information is needed to determine if the proposal is consistent with this policy.

Chapter 7 – Freshwater	
Objective 7.2.3 **Protection of intrinsic value of waterbodies and their riparian Zones** The overall quality of freshwater in the region is maintained or improved, and the life supporting capacity, ecosystem processes and indigenous species and their associated fresh water ecosystems are safeguarded.	The proposal has been designed to have setbacks from waterways. The applicant is not proposing enhancement (native planting), which would have benefits to the intrinsic values of these waterbodies, but this could be included as a consent condition in order to give better effect to this objective. The proposal will result in construction and operational phase stormwater discharges, and construction phase earthworks could cause discharge of sediment. It is likely that construction phase discharges and associated effects of can be managed through erosion and sediment control plans, spill and refuelling protocols and site management. To determine consistency with this objective, further information would be needed to determine the effects of any construction and operational phase discharges from the site, and conditions imposed to require ecological enhancement of the margins of adjacent waterbodies.
Policy 7.3.1 **Adverse effects of activities on the natural character of freshwater** To identify the natural character values of fresh water bodies and their margins in the region and to: 1. preserve natural character values where there is a high state of natural character; 2. natural character values where they are modified but highly valued; and 3. improve natural character values where they have been degraded to unacceptable levels;	Further information is needed to determine the current natural character values of the lake and river that could be affected by the project. The proposal has been designed to have setbacks from waterbodies. The applicant is not proposing any enhancement (native planting), which would have benefits to the intrinsic values of these waterbodies, but this could be included as a consent condition in order to give better effect to this policy. Further information is required to determine whether the project is consistent with this policy.

unless modification of the natural character values of a fresh water body is provided for as part of an integrated solution to water management in a catchment in accordance with Policy 7.3.9, which addresses remedying and mitigating adverse effects on the environment and its natural character values	
Policy 7.3.3 **Enhancing fresh water environments and biodiversity** To promote, and where appropriate require the protection, restoration and improvement of lakes, rivers, wetlands and their riparian zones and associated Ngāi Tahu values, and to: 1. identify and protect areas of significant indigenous vegetation and significant habitats, sites of significant cultural value, wetlands, lakes and lagoons/Hapūa, and other outstanding water bodies; and 2. require the maintenance and promote the enhancement of indigenous biodiversity, inland basin ecosystems and riparian zones; and 3. promote, facilitate or undertake pest control.	The proposal has been designed to have setbacks from waterbodies. The applicant is not proposing any enhancement (native planting), which would have benefits to the intrinsic values of these waterbodies, but this could be included as a consent condition in order to give better effect to this policy. 1. The site is adjacent to a Site of Natural Significance, and lies within Sites and Areas of Significance to Māori, identified in the Mackenzie District Plan. All these areas will need to be protected. More information is required to determine whether this protection will be accomplished. In particular further engagement will need to take place with manawhenua. 2. Further information is needed on the state of riparian zones. 3. Information is needed regarding the presence of pest species (including wilding conifers) on the site and how these will be managed. To fully determine consistency with this policy, further detail on the current state of the site, and proposed mitigations (including the suitability of proposed mitigations to protect values) and methodology is required.
Policy 7.3.6 **Fresh water quality**	2. Further detail on the potential discharges relating to the proposed activity (temporary construction phase and operational

In relation to water quality: 1. to establish and implement minimum water quality standards for surface water and groundwater resources in the region, which are appropriate for each water body considering: a. the values associated with maintaining life supporting capacity, ecosystem processes and indigenous species including their associated ecosystems, and natural character of the water body; b. any current and reasonably foreseeable requirement to use the water for individual, marae or community drinking water or stockwater supplies, customary uses or contact recreation; c. the cultural significance of the fresh water body and any conditions or restrictions on the discharge of contaminants that may be necessary or appropriate to protect those values; and d. any other current or reasonably foreseeable values or uses; and 2. to manage activities which may affect water quality (including land uses), singularly or cumulatively, to maintain water quality at or above the minimum standard set for that water body; and 3. where water quality is below the minimum water quality standard set for that water body, to avoid any additional allocation of water for abstraction from that water body and any additional discharge of contaminants to that water body, where any further abstraction or discharges, either singularly or cumulatively, may further adversely affect the water quality in that water body:	phase), as well as and further detail on proposed mitigations and methodology will need to be provided to assess effects on water quality.

a. until the water quality standards for that water body are met; or b. unless the activities are undertaken as part of an integrated solution to water management in the catchment in accordance with Policy 7.3.9, which provides for the redress of water quality within that water body within a specified timeframe.	
Policy 7.3.7 **Water quality and land uses** To avoid, remedy or mitigate adverse effects of changes in land uses on the quality of fresh water (surface or ground) by: 1. identifying catchments where water quality may be adversely affected, either singularly or cumulatively, by increases in the application of nutrients to land or other changes in land use; and 2. controlling changes in land uses to ensure water quality standards are maintained or where water quality is already below the minimum standard for the water body, it is improved to the minimum standard within an appropriate timeframe.	2. To determine consistency with this policy, further detail on the proposed discharges relating to the proposed activity (temporary construction phase and operational phase, as well as stocking of sheep), as well as further detail on proposed mitigations and methodology will need to be provided to assess effects on water quality. It is likely that erosion and sediment control measures, including erosion and sediment control plan/ management, if suitable, would help to give effect to this policy.
Chapter 9 – Ecosystems and Indigenous Biodiversity	
Objective 9.2.1 **Halting the decline of Canterbury's ecosystems and indigenous biodiversity** The decline in the quality and quantity of Canterbury's ecosystems and indigenous biodiversity is halted and their life-supporting capacity and mauri safeguarded.	Although the ecological assessment supplied by the applicant concludes that the site has low ecological value, no measures have been suggested to maintain or enhance the remaining indigenous biodiversity. The applicant is not proposing any enhancement (native planting), which would have benefits to the intrinsic values of the adjacent waterbodies, but this could be included as a consent condition in order to give better effect to this objective.

	To fully determine consistency with this objective further detail on proposed mitigations and methodology is required.
Objective 9.2.2 **Restoration or enhancement of ecosystems and indigenous biodiversity** Restoration or enhancement of ecosystem functioning and indigenous biodiversity, in appropriate locations, particularly where it can contribute to Canterbury's distinctive natural character and identity and to the social, cultural, environmental and economic well-being of its people and communities.	Although the ecological assessment supplied by the applicant concludes that the site has low ecological value, no measures have been suggested to restore or enhance the indigenous biodiversity within or surrounding the site. The applicant is not proposing any enhancement (native planting), which would have benefits to the intrinsic values of the adjacent waterbodies, but this could be included as a consent condition in order to give better effect to this objective. To fully determine consistency with this objective, further detail on proposed mitigations and methodology is required.
Objective 9.2.3 **Protection of significant indigenous vegetation and habitats** Areas of significant indigenous vegetation and significant habitats of indigenous fauna are identified and their values and ecosystem functions protected.	The site is adjacent to Lake Benmore which is a Site of Natural Significance identified in the Mackenzie District Plan. This has been identified using the CRPS Appendix 3 criteria. More detail is required to determine how this site will be protected. That information is needed to determine whether the project is consistent with this objective.
Policy 9.3.1 **Protecting significant natural areas** 1. Significance, with respect to ecosystems and indigenous biodiversity, will be determined by assessing areas and habitats against the following matters: a. Representativeness b. Rarity or distinctive features c. Diversity and pattern	The site is adjacent to Lake Benmore which is a Site of Natural Significance identified in the Mackenzie District Plan. This has been identified using the CRPS Appendix 3 criteria. More detail is required to determine how this site will be protected. That information is needed to determine whether the project is consistent with this policy.

d. Ecological context The assessment of each matter will be made using the criteria listed in Appendix 3. 2. Areas or habitats are considered to be significant if they meet one or more of the criteria in Appendix 3. 3. Areas identified as significant will be protected to ensure no net loss of indigenous biodiversity or indigenous biodiversity values as a result of land use activities.	
Policy 9.3.2 **Priorities for protection** To recognise the following national priorities for protection: 1. Indigenous vegetation in land environments where less than 20% of the original indigenous vegetation cover remains. 2. Areas of indigenous vegetation associated with sand dunes and wetlands. 3. Areas of indigenous vegetation located in "originally rare" terrestrial ecosystem types not covered under (1) and (2) above. 4. Habitats of threatened and at risk indigenous species.	Further detail on how these areas will be protected, and whether other areas of indigenous vegetation located in "originally rare" terrestrial ecosystem types are present on the site, is required before a determination can be made as to whether the proposal is consistent with this policy.
Policy 9.3.4 **Promote ecological enhancement and restoration** To promote the enhancement and restoration of Canterbury's ecosystems and indigenous biodiversity, in appropriate locations, where this will improve the functioning and long term sustainability of these ecosystems.	Although the ecological assessment supplied by the applicant concludes that the site has low ecological value, no measures have been suggested to enhance or restore indigenous biodiversity. The applicant is not proposing any enhancement (native planting), which would have benefits to the intrinsic values of the adjacent waterbodies, but this could be included as a consent condition in order to give better effect to this objective. To fully determine consistency with this policy further detail on proposed mitigations and methodology is required.
Chapter 10 – Beds of Rivers and Lakes and their Riparian Zones	

Objective 10.2.1 **Provision for activities in beds and riparian zones and protection and enhancement of bed and riparian zone values** Enable subdivision, use and development of river and lake beds and their riparian zones while protecting all significant values of those areas, and enhancing those values in appropriate locations.	Although the proposal includes at least 200m setbacks from the Tekapo River and Lake Benmore, no measures have been suggested to maintain or enhance the remaining indigenous biodiversity within those riparian margins. The applicant is not proposing any enhancement (native planting), which would have benefits to the intrinsic values of the adjacent waterbodies, but this could be included as a consent condition in order to give better effect to this objective. To fully determine consistency with this objective, further detail on proposed mitigations and methodology is required.
Objective 10.2.4 **Public and Ngāi Tahu access to and along rivers and lakes** Maintenance and enhancement of public and Ngāi Tahu access to and along rivers and lakes.	Further information is needed to determine how access to and along the Tekapo River and Lake Benmore would be impacted by the project.
Policy 10.3.2 **Protection and enhancement of areas of river and lake beds and their riparian zones** To preserve the natural character of river and lake beds and their margins and protect them from inappropriate subdivision, use and development, and where appropriate to maintain and/or enhance areas of river and lake beds and their margins and riparian zones where: 1. they exist in a degraded state and enhancement will achieve long-term improvement in those values; 2. they have ecological values for which protection and/or enhancement will assist in the establishment or re-establishment of indigenous biodiversity or ecosystems, particularly for ecosystems that are threatened or unrepresented in protected areas; 3. they have existing significant trout or salmon habitat;	Although the proposal includes at least 200m setbacks from the Tekapo River and Lake Benmore, no measures have been suggested to maintain or enhance the remaining indigenous biodiversity within those riparian margins. The applicant is not proposing any enhancement (native planting), which would have benefits to the intrinsic values of the adjacent waterbodies, but this could be included as a consent condition in order to give better effect to this policy. Further information is needed to determine the existing state of the river beds and their riparian margins, and what ecological values are present and appropriate measures to protect and/or enhance them. To fully determine consistency with this objective further detail on proposed mitigations and methodology is required.

4. maintenance and/or enhancement will improve or establish connections between habitats and create corridors for indigenous species and trout and salmon and their movement between areas; 5. riparian zones provide a buffer from activities that may adversely affect bed values; 6. opportunities exist to create habitat corridors for plants and animals; or 7. riparian zones provide spawning or other significant habitats for at risk or threatened species, such as inanga or Canterbury mudfish.	
Policy 10.3.4 **Removal of vegetation and bed material from river beds** To manage the use and removal of vegetation and bed material in river beds and their margins to ensure: 1. the maintenance of flood-carrying capacity of rivers 2. the protection of essential structures; and 3. erosion control and prevention. provided its management does not adversely affect: a. the instream and other values of the beds including habitat and associated ecosystems; or b. the stability, performance, operation and maintenance, upgrade and repair of essential structures	To fully determine consistency with this policy, further detail on the proposed site plan, works and construction methodology is required.
Policy 10.3.5 **Maintenance and enhancement of public and Ngāi Tahu access** To promote the maintenance and enhancement of public and Ngāi Tahu access to and along the beds of rivers and lakes, and to ensure that subdivision use and development does not result in inappropriate loss of existing access, subject to:	Further information is needed to determine how access to and along the Tekapo River and Lake Benmore would be impacted by the project.

1. protecting public health and safety, and avoiding conflict between different types of access; 2. avoiding adverse effects on the values of the beds, or stability of banks; 3. protecting Ngāi tahu cultural values and sites of significance from inappropriate public access; 4. protecting the stability, performance and operation of essential structures in, on, under or over the beds; 5. ensuring the integrity of flood-protection vegetation is maintained; 6. avoiding conflicts with the legal rights and lawful activities of owners/occupiers of river or lake beds and adjacent land, or of the owners/operators of infrastructure in, on, under or over the bed; and 7. engaging with the Walking Access Commission to identify and negotiate issues around public access.	
Chapter 11 – Natural Hazards	
Objective 11.2.1 **Avoid new subdivision, use and development of land that increases risks associated with natural hazards** New subdivision, use and development of land which increases the risk of natural hazards to people, property and infrastructure is avoided or, where avoidance is not possible, mitigation measures minimise such risks.	Through Plan Change 28, Mackenzie District Council introduced a flood hazard assessment overlay, which covers the site, and a hydro-inundation overlay (relating to the Waitaki Power Scheme) that covers parts of the site. Part of the site also lies within the Liquefaction Assessment Overlay. Although a flood assessment has been provided by the applicant, it has not modelled a 1 in 500 year event as required under the RPS. A revised assessment should be carried to ensure that the substation, and transformers are not placed in high flood hazard areas. No assessment has been provided on the risk of liquefaction on the site.

	To fully determine consistency with this Objective, an updated flood hazard assessment and a liquefaction hazard assessment should be undertaken.
Policy 11.3.1 Avoidance of inappropriate development in high hazard areas To avoid new subdivision, use and development (except as provided for in Policy 11.3.4) of land in high hazard areas, unless the subdivision, use or development: 1. is not likely to result in loss of life or serious injuries in the event of a natural hazard occurrence; and 2. is not likely to suffer significant damage or loss in the event of a natural hazard occurrence; and 3. is not likely to require new or upgraded hazard mitigation works to mitigate or avoid the natural hazard; and 4. is not likely to exacerbate the effects of the natural hazard; or 5. Outside of greater Christchurch, is proposed to be located in an area zoned or identified in a district plan for urban residential, industrial or commercial use, at the date of notification of the CRPS, in which case the effects of the natural hazard must be mitigated; or 6. Within greater Christchurch, is proposed to be located in an area zoned in a district plan for urban residential, industrial or commercial use, or identified as a "Greenfield Priority Area" on Map A of Chapter 6, both at the date the Land Use Recovery Plan was notified in the Gazette, in which the effect of the natural hazard must be avoided or appropriately mitigated; or 7. Within greater Christchurch, relates to the maintenance and/or upgrading of existing critical or significance infrastructure.	Through Plan Change 28, Mackenzie District Council introduced a flood hazard assessment overlay, which covers the site, and a hydro-inundation overlay (relating to the Waitaki Power Scheme) that covers parts of the site. Part of the site also lies within the Liquefaction Assessment Overlay. Although a flood assessment has been provided by the applicant, it has not modelled a 1 in 500 year event as required under the RPS. A revised assessment should be carried to ensure that the substation, and transformers are not placed in high flood hazard areas. No assessment has been provided on the risk of liquefaction on the site. To fully determine consistency with this Objective, an updated flood hazard assessment and a liquefaction hazard assessment should be undertaken.

Policy 11.3.2 **Avoid Development in areas subject to inundation** In areas not subject to Policy 11.3.1 that are subject to inundation by a 0.5% AEP flood event; any new subdivision, use and development (excluding critical infrastructure) shall be avoided unless there is no increased risk to life, and the subdivision, use or development: 1. is of a type that is not likely to suffer material damage in an inundation event; or 2. is ancillary or incidental to the main development; or 3. meets all of the following criteria: a. new buildings have an appropriate floor level above the 0.5% AEP design flood level; and b. hazardous substances will not be inundated during a 0.5% AEP flood event; provided that a higher standard of management of inundation hazard events may be adopted where local catchment conditions warrant (as determined by a cost/benefit assessment). When determining areas subject to inundation, climate change projections including sea level rise are to be taken into account.	The site is identified as being within the Mackenzie District Council's Flood Hazard Assessment Overlay. It is recommended that a flood assessment (which would determine if the site would be subject to a 0.5% AEP flood event) is undertaken or order for the activity to be assessed under this policy, particularly with respect to clause 3(b) of the policy. 3. it is important to note that hazardous substances will need to be stored in a place that will not be inundated during a 1 in 200 year inundation event.
Policy 11.3.5 **General risk management approach** For natural hazards and/or areas not addressed by policies 11.3.1, 11.3.2, and 11.3.3, subdivision, use or development of land shall be avoided if the risk from natural hazards is unacceptable. When determining whether risk is unacceptable, the following matters will be considered: 1. the likelihood of the natural hazard event; and 2. the potential consequence of the natural hazard event for: people and communities, property and infrastructure and	An assessment of natural hazard risks at the site should be undertaken to determine the best approach to management of those risks. Through Plan Change 28, Mackenzie District Council introduced a flood hazard assessment overlay, which covers the site, and a hydro-inundation overlay (relating to the Waitaki Power Scheme) that covers parts of the site. Part of the site also lies within the Liquefaction Assessment Overlay.

the environment, and the emergency response organisations. Where there is uncertainty in the likelihood or consequences of a natural hazard event, the local authority shall adopt a precautionary approach. Formal risk management techniques should be used, such as the Risk Management Standard (AS/NZS ISO 31000:2009) or the Structural Design Action Standard (AS/NZS 1170.0:2002).	Although a flood assessment has been provided by the applicant, it has not modelled a 1 in 500 year event as required under the RPS. A revised assessment should be carried to ensure that the substation, and transformers are not placed in high flood hazard areas. No assessment has been provided on the risk of liquefaction on the site. To fully determine consistency with this Objective, an updated flood hazard assessment and a liquefaction hazard assessment should be undertaken.
Chapter 12 – Landscape	
Objective 12.2.1 **Identification and protection of outstanding natural features and landscapes** Outstanding natural features and landscapes within the Canterbury region are identified and their values are specifically recognised and protected from inappropriate subdivision, use, and development.	The site is within an Outstanding Natural Landscape. The applicant has provided a landscape assessment, which concludes that the proposal does not avoid effects on the outstanding natural landscape values, with the overall impact at a low to moderate level. To determine consistency with this objective, more detail is needed on proposed methods to mitigate effects on the landscape values of the site.
Policy 12.3.2 **Management methods for outstanding natural features and landscapes** To ensure management methods in relation to subdivision, use or development, seek to achieve protection of outstanding natural features and landscapes from inappropriate subdivision, use and development.	The site is within an Outstanding Natural Landscape. The applicant has provided a landscape assessment, which concludes that the proposal does not avoid effects on the outstanding natural landscape values, with the overall impact at a low to moderate level.

	To determine consistency with this objective, more detail is needed on proposed methods to mitigate effects on the landscape values of the site.
Policy 12.3.4 **Consistency of identification and management of outstanding natural features and outstanding natural landscapes** Seek to achieve regional consistency in the identification of outstanding natural features and landscape areas and values by: 1. considering the following assessment matters which address biophysical, sensory and associative values when assessing landscapes in the Canterbury region: a. Natural science values b. Legibility values c. Aesthetic values d. Transient values e. Tāngata whenua values f. Shared and recognised values g. Historic values 2. requiring methods for landscape management to be developed and considered, having regard to the management methods in adjoining districts or regions, and the extent to which these may, in combination, protect outstanding natural features and landscapes.	2. It is important to note that there are other proposals for large solar arrays on the Mackenzie basin, with at least one adjoining the Haldon Solar project site. Cumulative effects on this Outstanding Natural Landscape should be considered when assessing this application, and others that will be forthcoming. Mitigation measures need to address those cumulative effects. To determine consistency with this objective, more detail is needed on proposed methods to mitigate effects on the landscape values of the site.
Chapter 14 – Air Quality	
Objective 14.2.1 **Maintain or improve ambient air quality** Maintain or improve ambient air quality so that it is not a danger to people's health and safety, and reduce the nuisance effects of low ambient air quality.	Given the size of the site, and provided good construction management techniques are adhered to, dust and nuisance effects should be managed appropriately so that it is not a danger to people's health and safety. It is considered that the proposed activity would likely be consistent with this objective.

Objective 14.2.2 **Localised adverse effects of discharges on air quality** Enable the discharges of contaminants into air provided there are no significant localised adverse effects on social, cultural and amenity values, flora and fauna, and other natural and physical resources.	Given the size of the site, and provided good construction management techniques are adhered to, dust and nuisance effects should be managed appropriately so that there are not significant localised effects on social, cultural and amenity values, flora and fauna and other natural and physical resources. It is considered that the proposed activity would likely be consistent with this objective.
Policy 14.3.1 **Maintain and improve ambient air quality** In relation to ambient air quality: 1. To set standards to maintain ambient air quality in Canterbury based on concentrations of contaminants that cause adverse health effects and nuisance 2. Where existing ambient air quality is higher than required by the standards set, to only allow the discharge of contaminants into air where the adverse effects of the discharge on ambient air quality are minor. 3. To give priority to ensuring that PM10 ambient air quality improvements are achieved in Rangiora, Kaiapoi, Christchurch, Ashburton, Timaru, Geraldine and Waimate.	Given the size of the site, and provided good construction management techniques are adhered to, dust and nuisance effects should be managed appropriately so that it is not a danger to people's health and safety. It is considered that the proposed activity would likely be consistent with this policy.
Policy 14.3.3 **Avoid, remedy or mitigate localised adverse effects on air quality** To set standards, conditions and terms for discharges of contaminants into the air to avoid, remedy or mitigate localised adverse effects on air quality.	Given the size of the site, and provided good construction management techniques are adhered to, dust and nuisance effects should be managed appropriately so that there are not significant localised effects. It is considered that the proposed activity would likely be consistent with this policy.
Chapter 15 - Soils	
Objective 15.2.1 **Maintenance of soil quality**	Further detail would be required to understand the contaminant type and concentration to determine potential effects on soil quality. Further information is required to assess the proposed activities against this objective.

Maintenance and improvement of the quality of Canterbury's soil to safeguard their mauri, their life supporting capacity, their health and their productive capacity.	
Policy 15.3.1 **Avoid remedy or mitigate soil degradation** In relation to soil: 1. to ensure that land-uses and land management practices avoid significant long-term adverse effects on soil quality, and to remedy or mitigate significant soil degradation where it has occurred, or is occurring; and 2. to promote land-use practices that maintain and improve soil quality.	Further detail would be required to understand the contaminant type and concentration to determine potential effects on soil, and if the proposal could result in significant long-term soil degradation. Further information is required to assess the proposed activities against this policy.
Chapter 16 - Energy	
Objective 16.2.1 **Efficient use of energy** Development is located and designed to enable the efficient use of energy, including: 1. maintaining an urban form that shortens trip distances 2. planning for efficient transport, including freight 3. encouraging energy-efficient urban design principles 4. reduction of energy waste 5. avoiding impacts on the ability to operate energy infrastructure efficiently.	4. The siting of the solar farm within such close proximity to the national grid will ensure that there is minimal energy wastage in the conveying of electricity from the proposal substation to the transmission lines. However, Renewable Electricity Generation closer to existing urban areas, where the bulk of the electricity is used would give better effect to this objective. Further information is required to assess the proposed activities against this objective. Provided Transpower do not raise concerns around their ability to operate their energy infrastructure, the proposed activity would be consistent with this objective.
Objective 16.2.2 **Promote a diverse and secure supply of energy** Reliable and resilient generation and supply of energy for the region, and wider contributions beyond Canterbury, with a particular emphasis on renewable energy, which: 1. provides for the appropriate use of the region's renewable resources to generate energy;	If the proposal was to go ahead, it would contribute positively to energy security and add resilience to the energy generation capabilities in Canterbury and New Zealand more broadly. It would also increase New Zealand's renewable energy capacity. 1. The project would make use of the high sunshine hours and flat land on the Mackenzie Basin to generate energy. 2. The project would reduce dependency on fossil fuels.

2. reduces dependency on fossil fuels; 3. improves the efficient end-use of energy; 4. minimises transmission losses; 5. is diverse in the location, type and scale of renewable energy development; 6. recognises the locational constraints in the development of renewable electricity generation activities; and a. avoids any adverse effects on significant natural and physical resources and cultural values or where this is not practicable, remedies or mitigates; and b. appropriately controls other adverse effects on the environment.	4. The siting of the solar farm in such close proximity to the national grid will ensure that there is minimal transmission loss in conveying the electricity to existing national grid facilities. However, Renewable Electricity Generation closer to existing urban areas, where the bulk of the electricity is used would give better effect to this objective. 5. There are a number of other similar-sized solar farm applications being considered on the Mackenzie Basin, with one such proposal adjacent to this project site. This limits the diversity of location, type and scale of renewable energy development in the area. If all these projects were to go ahead, the Mackenzie Basin would contain at least five solar farms, totalling approximately 2,200ha, and producing approximately 1,328mW of energy. Given the Mackenzie Basin already produces 5,189GWh of energy from Hydro-electricity generation, this would mean that the Mackenzie Basin is producing a significant amount of renewable energy. Grouping renewable energy in one sub-region may be inconsistent with Objective 16.2.2.5 which seeks diversity in the location of renewable energy development. 6. Renewable Electricity Generation (REG) activities have logistical and operational constraints because they need to developed in locations where the electricity they produce can be connected to the national grid. Ideally generation activities should be sited close to where the electricity is used (mainly in urban centres) to minimise energy loss, but failing that, REG activities close to existing infrastructure such as substations and the national grid make sense. Solar arrays also have particular locational requirements, in that they should be in areas with high amounts of sunshine, and on reasonably flat terrain. The proposed site fits those requirements.

	To determine adverse effects and consistency with this objective, further information is needed on the values present at the site, and steps taken to avoid, remedy or mitigate any effects, including cumulative effects of multiple solar farm proposals in the Mackenzie Basin.
Policy 16.3.3 **Benefits of renewable energy generation facilities** To recognise and provide for the local, regional and national benefits when considering proposed or existing renewable energy generation facilities, having particular regard to the following: 1. maintaining or increasing electricity generation capacity while avoiding, reducing or displacing greenhouse gas emissions; 2. maintaining or increasing the security of supply at local and regional levels, and also wider contributions beyond Canterbury; by diversifying the type and/or location of electricity generation; 3. using renewable natural resources rather than finite resources; 4. the reversibility of the adverse effects on the environment of some renewable electricity generation facilities; 5. avoiding reliance on imported fuels for the purposes of generating electricity; and 6. assisting in meeting international climate obligations.	1. The Haldon Solar project would increase electricity generation capacity and displace greenhouse gas emissions. 2. The project would also increase security of supply at local and regional levels by reducing the reliance on hydro-electricity generation that is dependent on lake levels being maintained. However, as noted above, there are some concerns with concentrating such a large amount of the nation's electricity generation I one location. 3. The project uses renewable natural resources to generate electricity. 4. Should the project be discontinued at any stage, or come to the end of its life, the structures could be removed from the site and the land returned to its existing use. This would generate a large amount of waste for disposal with significant environmental effects. 5. The project would reduce reliance on imported fuels for electricity generation. 6. By displacing the need to use fossil fuels for electricity generation , the project would assist New Zealand in meeting international climate obligations. While noting the concerns outlined above, it is considered that the proposed activity would likely be consistent with this policy.
Policy 16.3.4 **Reliable and resilient electricity transmission network within Canterbury**	1. The project would have benefits for Canterbury and nationally by allowing for increased supply to the national grid. 3. More detail is required to determine how adverse effects on significant natural and physical resources and cultural values are

To encourage a reliable and resilient national electricity transmission network within Canterbury by: 1. having particular regard to the local, regional and national benefits when considering operation, maintenance, upgrade or development of the electricity transmission network; 2. avoiding subdivision, use and development including urban or semi urban development patterns, which would otherwise limit the ability of the electricity transmission network to be operated, maintained, upgraded and developed; 3. enabling the operational, maintenance, upgrade, and development of the electricity transmission network provided that, as a result of route, site and method selection, where; a. the adverse effects on significant natural and physical resources or cultural values are avoided, or where this is not practicable, remedied or mitigated; and b. other adverse effects on the environment are appropriately controlled.	to be avoided, remedied or mitigated, and other effects on the environment are to be controlled. More information is required to determine whether the project would be consistent with this policy.
Policy 16.3.5 **Efficient, reliable and resilient electricity generation within Canterbury** To recognise and provide for efficient, reliable and resilient electricity generation within Canterbury by: 1. avoiding subdivision, use and development which limits the generation capacity from existing or consented electricity generation infrastructure to be used, upgraded or maintained; 2. enabling the upgrade of existing, or development of new electricity generation infrastructure, with a particular emphasis on encouraging the operation, maintenance and	2. As outlined under Objective 16.2.2 above, solar farm projects have locational, functional and operational constraints that make the proposed location suitable for such development. More information is needed to fully assess the environmental and cultural effects of the proposal and how those effects could be appropriately managed. To determine consistency with this policy, further information is needed to determine the potential environmental effects of the proposed energy generation on natural and physical resources.

upgrade of renewable electricity generation activities and associated infrastructure: a. having particular regard to the locational, functional, operational or technical constraints that result in renewable electricity generation activities being located or designed in the manner proposed; b. provided that, as a result of site, design and method selection: i. the adverse effects on significant natural and physical resources or cultural values are avoided, or where this is not practicable remedied, mitigated or offset; and ii. other adverse effects on the environment are appropriately controlled. 3. providing for activities associated with the investigation, identification and assessment of potential sites and energy sources for renewable electricity generation; 4. maintaining the generation output and enabling the maximum electricity supply benefit to be obtained from the existing electricity generation facilities within Canterbury, where this can be achieved without resulting in additional significant adverse effects on the environment which are not fully offset or compensated.	
Chapter 17 – Contaminated Land	
Objective 17.2.1 **Protection from adverse effects of contaminated land** Protection of people and the environment from both on-site and off-site adverse effects of contaminated land	The site of the proposed substations and batteries would be considered HAIL sites. Provided these sites are managed appropriately, the proposed activities would likely be consistent with this objective.
Policy 17.3.2 **Development of, or discharge from contaminated land**	Information available does not indicate that the site in its current condition is contaminated, however it is advised that further investigations are undertaken to determine any contaminant levels

In relation to actually or potentially contaminated land, where new subdivision, use or development is proposed on that land, or where there is a discharge of the contaminant from that land: 1. a site investigation is to be undertaken to determine the nature and extent of any contamination; and 2. if it is found that the land is contaminated, except as provided for in Policy 17.3.3, the actual or potential adverse effects of that contamination, or discharges from the contaminated land shall be avoided, remedied or mitigated in a manner that does not lead to further significant adverse effects.	(or not) at the site, to ensure that sufficient baseline data is available, and if remediation would be required post-activity. It is likely that this proposed activity would be consistent with this policy. A contaminated site has been identified adjacent to the site and consent conditions should be developed to ensure that this contamination is not spread by the proposed activity.
Chapter 18 – Hazardous Substances	
Objective 18.2.1 **Avoid, remedy or mitigate adverse effects** Adverse effects on the environment from the storage, use, disposal and transportation of hazardous substances are avoided, remedied or mitigated.	It is likely that the site will contain areas where hazardous substances are stored. Provided this storage occurs in accordance with relevant legislation and it carried out appropriately, it is considered that the proposed activity would be consistent with this objective.
Objective 18.2.2 **New contamination of land** To avoid contamination of land.	The location of the batteries would be identified as HAIL, but the area containing solar panels would not. Provided appropriate measures are taken with the installation and management of substations and batteries, the proposed activity would likely be consistent with this objective.
Policy 18.3.1 **Protection of sensitive areas and activities** Avoid actual or potential adverse effects, resulting from the use, storage or disposal of hazardous substances, in the following locations: 1. High hazard areas	It is likely that the site will contain areas where hazardous substances are stored. Provided this storage occurs in accordance with relevant legislation and it carried out appropriately, it is considered that the proposed activity would be consistent with this policy.

2. Within a community drinking water protection zone, or within such a distance from a community drinking water supply that there is a risk of contamination of that drinking water source 3. In areas of unconfined or semi-confined aquifer, where the depth to groundwater is such that there is a risk of contamination of that groundwater 4. Within the coastal marine area and in the beds of lakes and rivers 5. Within any area identified by a district or regional plan as being sensitive to the potential effects of hazardous substances, which may include, but are not limited to, areas such as wāhi tapu, urupā, institutions and residential areas.	
Policy 18.3.2 **Avoid, remedy or mitigate adverse effects** To avoid, remedy or mitigate adverse effects on the environment, including contamination of land, air and water, associated with the storage, use, transportation or disposal of hazardous substances.	It is likely that the site will contain areas where hazardous substances are stored. Provided this storage occurs in accordance with relevant legislation and it carried out appropriately, it is considered that the proposed activity would be consistent with this policy.

APPENDIX 7 – NATURAL HAZARDS TECHNICAL ADVICE

From: Oliver Hermans – Canterbury Regional Council Natural Hazards Scientist

From: Oliver Hermans [redacted]
Sent: Friday, 12 September 2025 10:37 am
To: Reuben Herz-Edinger [redacted]
Subject: Re: Fast-Track Request - Lodestone Energy lodgement 3/9/25 - RMA251941

I'd be pretty comfortable if they're going to put culverts in. If that's what they're doing then culvert size would be good to know. If they're not doing that then realistically so long as they're not going to be filling the swales in I think the biggest issue they'd face is scouring of the roads if the flows get going at a decent clip. Which is going to be more of their issue than anything else.

In a more general sense, my biggest concern with something like this would be potential for off site effects, but accounting for the topography and location the odds of the neighbouring properties being affected are pretty minimal.

From: Reuben Herz-Edinger [redacted]
Sent: 12 September 2025 10:31 AM
To: Oliver Hermans [redacted]
Subject: RE: Fast-Track Request - Lodestone Energy lodgement 3/9/25 - RMA251941

Hey Oliver,

All good, thanks for getting back so fast!

The only thing I'd note is that they will be constructing criss-cross roads at the site (see site layout p.70/181 of application doc - C25C/214331-3), including around the easter/northern perimeters.

Would they need further comment on the roading impacting flow paths, or perhaps would culverts solve that issue if they proposed them?

Many thanks,
Reuben

From: Oliver Hermans [redacted]
Sent: Friday, 12 September 2025 9:24 am
To: Reuben Herz-Edinger [redacted]
Subject: Re: Fast-Track Request - Lodestone Energy lodgement 3/9/25 - RMA251941

Hi Reuben,

Apologies on the delay on getting back to you, there's been a lot of stuff that's come in over the last few weeks and its proving tricky to stay on top of everything.

We have not carried out an investigation in this area and hold no information specific to this location.

- Do you think the 450-year ARI is appropriate to use for the substation freeboard level?
  I am unaware of any required standard as far as substation elevation. The 450 ARI appears to be a measure adopted by Transpower rather than any specific requirement. In saying that as per the modelling supplied by the and our own observations in the area generally flood waters can be expected to be predominantly confined to the overland flow paths in the area for most events. As flood size increases, the risk of flood waters reaching ground of more average height increases, however the 300 mm elevation reduces the likelihood of such flows impacting the substation. When looing at the area, due to its wide, fand relatively flat topography, water will spread out and it is unlikely that depths will be significant enough to impact the substation.
- Do you think the 100-year ARI is appropriate to use for the solar array freeboard level?
  I am broadly in agreement that our knowledge of the area indicates that the modelling is correct in that the majority of flows will be confined to the swales/ channels. I am unaware of what if any standards are applied to infrastructure from a flood risk perspective, noting that the only controls I am aware of MDC imposing are with regard to residences (300 mm above the 500 year ARI flood). As it is unlikely that there are going to be residents at this locations such a standard is likely excessive.

300 mm allows for uncertainties in the modelling and any changes bought about by development of the site. Broadly I consider it appropriate, again noting that there does not seem to be any real requirement as far as elevation/ floor levels and based on the modelling flood waters are unlikely to breach the swales except in extreme circumstances so long as they are not altered/ blocked.

- Do you think the assessments provided are adequate to support this application, or would you have further questions that need to be answered?

The assessment looks to be robust and aligns with what we (Ecan) would note about the site. Again noting that Ecan itself has not undertaken an investigation itself into this area. Depths look to be reletively low and I consider it unlikely that even in larger events, a significant increase in water depth can be assumed. As stated above, I am unaware of any freeboard requirement for an activity of this type and from what I can tell the proposed freeboard is something that Transpower have implemented themselves.

So long as there are no significant alterations to the swales or actions to impede the flow of water through these swales I see no reason to think that the assessment is lacking or incomplete. I am satisfied that the location is not high hazard and as a result have no objections to the proposal or mitigation methods proposed.

Regards,

Oliver

APPENDIX 8 – Aoraki Environmental Consultancy Ltd (AECL) Advice

From: Kylie Hall – AECL Principal Planner

Haldon Station – Lodestone Energy Substantial Application

Updated: 11/09/2025

Schedule A Substantive Application Information Requirements relevant to Papatipu Rūnanga

Section	Requirement	Document Section	Completed
13(4)(j)	General Information Requirements – a list of the persons the applicant considers are likely to be affected by the project, including— (ii) iwi authorities and groups that represent hapū that are parties to relevant Mana Whakahono ā Rohe or joint management agreements: (iii) other relevant iwi authorities (iv) relevant Treaty settlement entities	Section 8	Y
13(4)(k)	a summary of— (i) the consultation undertaken for the purposes of section 11 (to be read as section 29 Pre-lodgement requirements for listed project) and any other consultation undertaken on the project with the persons and groups referred to in paragraph (j); and (ii) how the consultation has informed the project:	Section 8	Y (but brief)
13(4)(l)	A list of any Treaty settlements that apply to the project area, and a summary of the relevant principles and provisions in those settlements:	Section 8	Identifies the Treaty Settlement but does not provide a summary of the relevant principles and provisions
29(1)(a)	Before lodging a substantive application for a listed project, the authorised person for the project must— (a) consult the persons and groups referred to in section 11	2.2, 2.3, 8 and Appendix 12	N

Schedule B – Navigation Guidance Table for Information Required for the Resource Consents

Clause	Requirement	Document Section	Completed
5(1)(b)	a description and map of the site at which the activity is to occur, including whether the site is within or adjacent to – i. a statutory area (as defined in the relevant Treaty settlement Act); or	Section 3.2 Section 3.10.1	Y
5(2)(g)	The documents referred to in subclause (1)(h) are the following: a planning document recognised by a relevant iwi authority and lodged with a local authority.	Section 9.3 to 9.10	Y

6(e)	identification of persons who may be affected by the activity and any response to the views of any persons consulted, including the views of iwi or hapū that have been consulted in relation to the proposal	Section 8	Y
6(f)	If iwi or hapū elect not to respond when consulted on the proposal, any reasons that they have specified for that decision:		N/A If the applicant were to engage further with rūnaka, AECL and Arowhenua would be happy to continue the consultation process.
7(d)	any effect on natural and physical resources that have aesthetic, recreational, scientific, historical, spiritual, or cultural value, or other special value, for present or future generations:	Section 6.2	Y Not sure if it is adequate as it does not outline the effects on aesthetic, recreational, historical, spiritual, or cultural values, which are outlined the TRoNT Settlement Act 1998

Substantive Application

Activity Status:

- Mackenzie District Plan – Non-complying
- Canterbury Land and Water Regional Plan – Discretionary

Relevant Overlays:

- Sites and Areas of Significance to Māori:
  - The entire site is within SASM9 – Tauwharekura and is in proximity to
  - SASM48 – Te Pā-o-Kāti-Kurī / Mount Maggie and
  - SASM19 – Te Ao Mārama / Lake Benmore;
- Area of Visual Vulnerability (Medium and High);
- Lakeside Protection Area (southern part of the site);
- Hazards:
  - the southern part of the site is located within a Hydro Electricity Inundation Hazard Area;
  - part of the site is identified as a Lakeside Protection Area;
  - the entire site is in a Flood Hazard Assessment overlay; and
  - part of the site is subject to a Liquefaction overlay;

Consultation

No hui has taken place between Lodestone and AECL on behalf of Arowhenua. The only in person discussions that have taken place were with two Cultural Consultants during the site visits. No correspondence has taken place with the planners at AECL.

Date	Communication	Confirmed (Y/N)
12 Dec 2023	Initial contact (email) made by Haldon Station to Te Rūnanga o Ngāi Tahu (Justin Tipa, kaiwhakahaere for Te Rūnanga o Moeraki) – introduction of investigations into potential solar development.	AECL was not involved/informed

	Invitation to engage (including site visit).	
15 Dec 2023, 22 Jan 2024, 7 Feb 2024	Email exchanges with J Tipa arranging for meetings	AECL was not involved/informed
5 June 2024	Site visit / meeting with representatives of AECL, Aukaha and Waihao.	Two Cultural Consultants from AECL attended (Mike McMillan and Sally Reihana). Waihao did not attend.
7 Jun 2024	Confirmation (email) of ongoing engagement re technical investigations (ecology, landscape, etc.).	Y
4 October 2024	South Island Project Update (letter) Status update for Haldon, together with other Lodestone Energy solar projects in the Canterbury region.	Y
10 October 2024	Ecology site visit with Peter Espie (ecologist), representatives of AECL	Two Cultural Consultants from AECL attended (Mike McMillan and Sally Reihana). Peter Espie was contracted by the Applicant to complete the ecological assessment to accompany the AEE
19 March 2025	Email providing update to AECL, Te Rūnanga o Ngāi Tahu	Y
~~9~~ 10 April 2025	Circulation of <u>draft</u> landscape report to AECL, Aukaha	Y
~~6~~ 7 May 2025	Notice letter of intention to lodge FTAA application: AECL, Te Rūnanga o Moeraki	Y
6 May 2025	Acknowledgement email from Chairman, Te Rūnanga o Moeraki.	AECL was not involved/informed
17 May 2025	Letter in response from AECL providing comments on draft Landscape Assessment	Y
29 August 2025	Substantial Application is lodged with EPA	Y

<u>Additional Correspondence</u>:

7 October 2024 – AECL received an email from Daniel Cunningham confirming that the Haldon project had been included on the Fast Track Approvals Bill that had been publicly announced the previous day. The email stated, "*they were in we were in the dark on the timing of the announcement including whether we were on the list until a few hours before the list was made public*." No correspondence providing an update on this process was provided prior.

3 September 2025 – email from Brad Henderson to say that the substantial application had been lodged with EPA on Friday 29th August.

Accuracies In Application

1. Construction is expected to take place over 14-18 months. Section 6.3.1 states: "*Construction of the project is expected to support approximately 235 - 242 direct jobs, 290 - 291 indirect jobs and 219 - 220 induced jobs. The construction phase is expected to draw on both local and regional labour pools, given the limited size of the Mackenzie District workforce and that of adjacent districts; and approximately 5 - 6 direct jobs will be sustained during the 35-year operational phase, reflecting ongoing maintenance and monitoring activities*." Have these numbers been tested? This is a lot of people for not much work. A similar sized solar farm being undertaken by Lodestone at Clandeboye mentioned only 30 people would be hired during the construction phase, which is substantially smaller than the 220 projected.
   Lodestone also contract a national recruitment company to undertake the hiring of staff; therefore, the hiring of local contractors/staff is not guaranteed.

2. No aerial assessment has been undertaken to determine the cumulative effects of the activity when viewed from the air
   - tourist flights,
   - commercial flights between major centres

3. The landscape assessment has stated that by avoiding individual significant sites, the effects are minimal. The assessment compartmentalises the landscape and does not assess how the whole landscape is seen eg. Section 9.6.8 states: "*whilst it is located on part of Tauwharekura / Grays Hills, iwi have not raised concerns in this regard. Overall, it is considered the Project will not result in adverse effects on the associated cultural values, and the Project is considered to be consistent with the Historic Heritage chapter of the RPS*".

4. Assessment of MDC Plan states that the proposal complies with Strategic Direction Objective MW-01 and MW-02 because a Kaitiaki Working Group will be established. This has not been discussed or agreed to with rūnanga. An assessment against the relevant SASM objectives and policies is not provided. The assessment for the provisions that are not relevant is larger.

5. Assessment against relevant objectives and policies of the CLWRP is poor. There is no assessment against the Canterbury Air Regional Plan provisions.

Draft Conditions

1. Conditions 5 – 8 reference the establishment of a Kaitiaki Working Group and how it is to work. Arowhenua rūnaka (including Chair Fiona Pimm) and AECL have no knowledge of this group. No correspondence has been received, and no discussions have occurred with Lodestone to explore the concept of a working group and how it will be established and run.

2. Condition 6(c) states that rūnanga will be offered an opportunity to provide feedback on the monitoring associated with the construction and operation of the solar farm. The wording

does not suggest that rūnanga will be invited to assist or suggest types or areas of monitoring that will be done.

3. Condition 7 states the consent holder is responsible for convening the meetings.

4. Condition 8 indicates draft management plans have not been prepared. Would the EPA require these to be formulated already?

From: Canterbury Regional Council

Pre-Application Advice for Lodestone Energy Ltd – RMA251941

Disclaimer: This technical advice note does not constitute legal advice and should not be relied upon as such. Please note this preliminary advice has been given prior to any official guidance from the Ministry for the Environment relating to Canterbury Regional Council's role under the Fast-Track Approvals Act 2024.

Meeting Date:	24 July 2025 – 3-4pm

Executive Summary

Lodestone Energy Ltd (Lodestone) (the applicant) have sought a meeting with Canterbury Regional Council (regional council) to discuss to potential option of using the Fast-Track Approval Act (FTAA) for Haldon Solar Project. The project **is** listed in Schedule 2 of the FTAA.

Regional Council Staff

- Nardia Feehan – Principal Consents Planner
- David Sluter – Senior Consents Planner: Project Management Officer
- Anna Stewart – Significant Consents Team Leader
- Reuben Herz-Edinger – Consents Planner

Lodestone

- Ethan Glover – Mitchell Daysh consultant
- Brad Henderson - Applicant

Introduction

Fast-Track Approvals Act Consenting:

Under the FTAA, the applicant is required under section 11(1)(a) to consult with relevant local authorities. Lodestone will need to provide evidence of this consultation as part of their application.

This pre-application meeting forms part of this consultation and discusses the process going forward for any potential applications by Lodestone under the FTAA.

Haldon Solar Project:

The applicant requested a pre-app meeting to discuss the proposed Fast-track application. Specifically, the applicant sought advice relating to the proposed development of an approximately 280ha utility-scale solar farm at the Haldon Station site, just east of Lake Benmore, for the following consents:

Section 9 Land Use Consent

- Earthworks for development of site. Precautionary as excavations may be within 1m of groundwater, potentially requiring consent under the Canterbury Land and Water Regional Plan (LWRP) Rule 5.176.

Section 15 Discharge Permits

- Construction-phase stormwater discharge for >2ha of disturbed ground during construction. Include new roading throughout site, trenching for cables, and excavations for new substation infrastructure. LWRP Rule 5.94B
- Operational stormwater discharge for both general solar farm area, as well as potentially separate consent for the substation area which could be transferred to Transpower. LWRP Rule 5.97.

Minutes – Notes – Advice

- **Overview from Brad**
  - Lodestone independent solar developer.
  - Three current operation solar farms in North Island, fourth nearly operational, fifth nearing commissioning. Roughly 1/10th size of Haldon Station. Most around 30MW / 40ha.
  - Haldon Station – Larger scale than previous farms. First with direct connection to national grid, with substation to connect into Transpower network running through site. Substation constructed by Lodestone and vested with Transpower.
  - Completed almost all documents, still finalising Ecological Assessment, which may inform additional reports, but hoping for this to be finalised end of this week (25/7).
- **Comments from Reuben**
  - Highlighted conditions around long-term soil sampling recommendations for metals/PFAS and concerns from Contaminated Land team around that.
  - Brad supported 10-yearly type of testing, and it was noted that existing Lodestone solar consent also has this requirement.
- **Substation**
  - Ethan considered that they could just have one full site operational stormwater consent and do a partial transfer to Transpower, though CRC consider it easier to transfer to Transpower if there is a separate operational consent for the substation. Ethan said they would consider the differences that may be needed there.
- **Substantive Lodgement/Process**
  - Nardia outlined how other applications have gone through the process and that once it gets to a panel stage it needs to have all issues figured out and agreed upon between the parties to ensure that it goes smoothly through panel stage.
  - Completeness check – regional council have five workings days to comment on application to EPA, so we want to see detailed plans / mitigations / conditions / assessments to ensure that all concerns are addressed.
  - Detailed Site Investigation (DSI) – 'Landfill' area seems to be moot point as its outside the site boundary, so DSI not required.

- **Conditions**
    - Need to have conditions set for completeness check.
    - Conditions currently reflect Resource Management Act consents (per Ethan), so this should address our concerns.
    - Acknowledge that most effects fairly well understood and standard conditions should manage effects. Just again note the further development of the long-term monitoring conditions such as including specific metal contaminants and limits, but generally expect that a fairly standard condition set should address the concerns.
- **Management Plans**
    - Lodestone: Can we leave these plans to be finalised in conjunction with consent authority/panel.
    - Brad proposed having some management plans perhaps 60% drafted but noting that site designs may be subject to change. Although they may need to change this seems to be a reasonable approach to the regional council.
    - Regional council agreed that for this project, general plans (e.g., Erosion Sediment Control Plan) usually acceptable but some details, e.g., for substation construction management, would be ideal.
- **Cumulative and Cultural effects**
    - Regional council noted that cumulated landscape effects can be of concern for territorial authority, rūnanga, and panel so must be addressed.
    - Lodestone has been in contact with Arowhenua, to be engaged throughout the process.
- **Moving forward**
    - Anna outlined that the regional council would provide feedback at each opportunity we have to comment under the FTAA process.
    - Outlined some of the process around panel selection and how regional council and Mackenzie District Council will have to nominate a joint representative.
    - If there are things outstanding, the panel convener may seek to resolve issues before the panel has been set, so important to have all issues ironed out before the panel stage to ensure that it can move smoothly through the process.
    - David highlighted that other legal issues (landowner approval, parties affected by non-environmental effects, e.g., Transpower) will be assessed and that it's good to have all that prepared.
    - Brad – Hoping to lodge by the end of next month, but very tentative pending finalisation of technical reviews, especially ecology report and how that may influence other assessments. Have had a legal peer review and some outstanding issues to address before lodging.
- **Follow up**
    - The existing conditions for solar farms create a framework but regional council can review and update the existing conditions based on latest developments. Reuben can follow up on changes to conditions and what we would be wanting there.

- Next meeting with any follow-ups from regional council's review on conditions, reports etc. Brad – Could book this week of 11th or 18th of August. A few people on leave before then.

Additional Information

Charging: As discussed in the meeting, all pre-lodgement advice from the regional council will be treated as regular pre-application advice, with time charged to advice number RMA251941 and an invoice provided once lodgement is confirmed and the pre-application file closes.
Communication (going forward): Key regional council contact to be David and Ethan/Brad as required.
Timelines for pre/ referral and substantive notification: Lodestone indicated they hoped to lodge by the end of August, though this may be extended pending review/finalisation of technical documents.

Next Steps:
ACTION – Reuben to provide more details around regional council's recommended long-term sampling conditions.
ACTION – Lodestone to submit proposed conditions for regional council to review.
ACTION – David to book in follow-up meeting for mid-late August.

Signed by

Reuben Herz-Edinger
Consents Planner

David Sluter
Senior Consents Planner - Project Management Officer

APPENDIX 10 – Mitchell Daysh: Memorandun

From: Mithcell Daysh Ltd (Applicant's consultant)

Memorandum

To: Canterbury Regional Council
From: Mitchell Daysh
Date: 15 September 2025
Re: FTAA-2508-1097 Haldon Solar Farm – further information

Emails of 11 and 12 September 2025 from R Herz-Edinger and subsequent discussions regarding the above refer.

The purpose of this memorandum is to provide further context to various matters that have been identified in the above correspondence. At the outset, Lodestone Energy records its appreciation to Canterbury Regional Council staff for the constructive nature of the communications received and the opportunity to provide this response, whether this is seen as a matter of completeness or not. On behalf of Lodestone Energy, we look forward to maintaining this open dialogue with Canterbury Regional Council, especially on matters that will come before us through the Fast Track process such as the development of conditions of consent.

The following matters have been identified and are addressed in turn:

- Access to water for firefighting purposes;
- Consultation with relevant iwi authorities and development of a Cultural Impact Assessment;
- Dewatering; and
- Contaminated land.

Access to water for firefighting purposes
Section 8.8 and Appendix 12 of the Substantive Application set out the engagement with Fire and Emergency New Zealand ("**FENZ**") in relation to the proposed Haldon Solar Farm. That engagement has confirmed that the site is considered a low risk of rapid fire spread due to the nature of the site vegetation and the enhanced access that will be provided to the site.
Also arising from that engagement, conditions have been proposed that require the development of an Emergency Management Plan in consultation with FENZ that will provide for access for emergency responders and set out appropriate emergency response procedures.

It follows that no specific application has been made in relation to water for firefighting purposes. This is based on the (low) level of identified risk and noting that FENZ can be self-sufficient in this regard and/or can rely on the provisions of Section 14(3)(e) of the Resource Management Act to access water for emergency purposes from local sources that may include Lake Benmore.

Consultation with iwi authorities
Lodestone Energy appreciates the feedback regarding the nature of engagement to date with the relevant iwi authorities in relation to the proposed Haldon Solar Farm. Lodestone Energy values its relationships with mana whenua and is committed to further and ongoing engagement with the relevant groups as the project develops. To this end, conditions of consent have been proffered relating to the establishment of a Kaitiaki Working Group as one mechanism for ensuring that ongoing involvement.
Section 8.4 and Appendix 12 of the Substantive Application otherwise set out the engagement with the relevant iwi authorities in relation to the proposal that has included various meetings, visits to the site and sharing of information. Since lodging, the suite of application documents has been provided directly

to Te Rūnanga a Moeraki, Arowhenua and the Aoraki Environmental Consultancy Ltd along with a further commitment from Lodestone Energy to further and ongoing engagement.
Lodestone Energy also acknowledges that mana whenua is best placed to provide interpretation and guidance in relation to the various iwi management plans, but as set out in Section 9.10.1 of the Substantive Application, Lodestone Energy confirms that it has considered and had regard to the iwi management plans in developing the application.
A question has also been raised whether a Cultural Impact Assessment would have been appropriate to submit with the application. We consider this a matter for mana whenua to determine and note that through earlier engagement with the relevant iwi authorities the need for or requirement for a Cultural Impact Assessment was not raised at any stage.
Regardless of the above, Lodestone Energy remains committed to responding to or addressing any matters of a cultural nature that may be raised.

Dewatering
Clarification has been sought in relation to dewatering of cable trenches and the reliance on Permitted Activity Rule 5.119 of the Canterbury Land and Water Regional Plan to achieve this. The following provides further context for the nature and scale of this activity and an assessment against the relevant conditions attaching to that rule.

Trenching and cable laying is a continuous process of opening of a narrow trench, laying of basecourse (if needed), laying of cable and backfilling the trench with the existing sediment to the same ground level such that subsurface flow is not diverted, and overland flow is not impounded or diverted. The trenching is left open only for the time that it takes to lay the cable and backfill the trench (usually only a couple of days) and undertaken in sections that are typically completed before works begin on the next section.
As set out in section 6.6 of the Substantive Application, cables may be buried up to 2.5 m below ground level. As set out in section 3.9 of the Substantive Application, groundwater level recordings from the nearest bore indicate a depth to groundwater that ranges from 6.76 m below to 0.26 m above the measuring point. It follows that groundwater may be intercepted and if so, some minor and temporary dewatering may be required. That said, cable laying is likely to be scheduled during periods when groundwater levels are at their lowest, to avoid the need for dewatering in the first instance.
Rule 5.119 of the Canterbury Land and Water Regional Plan provides for "*the taking of water from groundwater for the purpose of dewatering for carrying out excavation, construction, maintenance and geotechnical testing and the associated use and discharge of that water*" as a permitted activity, provided the relevant conditions are met. In noting that no Certificate of Compliance has been sought for this activity through the Fast Track process, the onus will remain on Lodestone Energy to comply with these requirements or otherwise seek a further consent.

The following table provides an analysis of the relevant conditions.

Table1: Rule 5.119

1. The take continues only for the time required to carry out the work but the take shall not last for a period exceeding 6 months;	Any take would be intermittent and temporary.
2. The take or discharge is not from, into, or onto contaminated or potentially contaminated land;	The take or discharge is not from or into potentially contaminated land.
3. The take does not lower the groundwater level more than 8 m below the ground level of the site or cause subsidence of any other site	The take will not lower groundwater levels.
4. The take does not have a moderate, high or direct stream depletion effect on a surface waterbody, determined in accordance with Schedule 9, unless the abstracted groundwater is being discharged to the surface waterbody to which it is hydraulically connected;	The take will not have any depletion effect on a surface water body.
5. An assessment of interference effects, undertaken in accordance with Schedule 12, does not show that any community, group or private drinking-water supply bore will be prevented from taking water	The take is temporary and will not result in any interference effects.

6. At the point and time of any discharge to surface water, the rate of flow in the river or artificial watercourse is at least five times the rate of the discharge	Any water will be discharged to land and there is no discharge to surface water.
7. The concentration of total suspended solids in any discharge to a surface waterbody does not exceed: (a) 50 g/m3 where the discharge is to any spring-fed river, Banks Peninsula river, or to a lake or wetland; or (b) 100 g/m^3 where the discharge is to any other river or to an artificial watercourse;	Any water will be discharged to land and there is no discharge to surface water.
8. The discharge after reasonable mixing with the receiving waterbody meets the visual clarity standards in Schedule 5	Any water will be discharged to land and there is no discharge to surface water.
9. The point of discharge is not within a Community Drinking-water Protection Zone as set out in Schedule 1.	Any water will be discharged to land and there is no discharge to surface water.

Contaminated land

Reference has been made to the (closed) Haldon landfill and uncertainty regarding its extent, leading to a suggestion that a Preliminary Site Investigation ("**PSI**") be undertaken to delineate its extent, along with some consideration that could be given to the balance of the solar farm site. We note that the Haldon Landfill site (as shown) is not on land owned by the Haldon Station and is not part of the lease arrangement with Lodestone Energy.

We note that PSI and any requirements for future investigations that may arise from undertaking such an investigation are more in the purview of Mackenzie District Council, but regardless we remain open to discussing with you (and Mackenzie District Council) whether this is a matter that requires further consideration and/or that can be appropriately managed through the imposition of relevant conditions of consent.

Closing

We trust this memorandum assists.

On behalf of Lodestone Energy, we reiterate our appreciation for the engagement with Canterbury Regional Council staff and look forward to this continuing.