Reference Number: 2024/1051

8 February 2024

[redacted]

Tēnā koe [redacted]

Thank you for email of 18 January 2024 requesting under the Local Government Official Information and Meetings Act 1987 (LGOIMA), information relating to the Foxton Solar Farm. Please see outlined below a response to your request.

A copy of the resource consent application and decision docs for a solar farm development recently approved in Foxton

Please see attached a copy of the application and decision.

You are entitled to seek an investigation and review by the Office of the Ombudsman. Information about how to make a complaint is available at www.ombudsman.parliament.nz or freephone 0800 802 602.

Horowhenua District Council publishes responses to Local Government Official Information and Meetings Act 1987 (LGOIMA) requests that we consider to be of wider public interest, or which relate to a subject that has been widely requested. To protect your privacy, we will not generally publish personal information about you, or information that identifies you. We will publish the LGOIMA response along with a summary of the request on our website. Requests and responses may be paraphrased.

If you would like to discuss this decision or any of the information provided as part of this request, please contact Blair Spencer (Group Manager Housing and Business) on blairsp@horowhenua.govt.nz

Ngā mihi

Steve McTaylor-Biggs
Executive Sponsor

APPROVAL OF RESOURCE CONSENT FOR THE ERECTION AND OPERATION OF A SOLAR FARM INCLUDING EARTHWORKS AND DUNE MODIFICATION WITHIN THE FOXTON DUNEFIELD LANDSCAPE DOMAIN AT BERGIN ROAD, FOXTON

RM number:	LUC/501/2022/18
Date:	12 October 2022
Site Address:	Bergin Road, Foxton
Legal description:	Lot 7 DP 68629 (RT WN37A/738) Lot 3 DP 27011 and Lot 4 DP 27011 (RT WN39A/818)
Applicant:	Far North Solar Farm Ltd
Agent:	The Catalyst Group
Address for service:	[redacted]

Council granted consent for the following reasons:

- Pursuant to section 95A and 95B of the Act, there are no mandatory requirements to notify the application, the effects of the proposal on the environment will be less than minor and there are no affected persons.
- All parties Council considers may be adversely affected by the proposal has given written approval to the application.
- Pursuant to section 104 of the Act, the effects of the proposal on the environment will be acceptable.
- Conditions imposed on the consent under section 108 of the Resource Management Act 1991 will control, mitigate and remedy any environmental effects caused by the proposal.
- The proposal is in accordance with the relevant objectives and policies of the District Plan.
- Council has given due regard to the New Zealand Coastal Policy Statement, any national, regional or proposed regional policy statement and any other regulations in reaching its decision.

1. PROPOSAL

The applicant's Assessment of Environmental Effects ("AEE") includes a description of the proposal, which I adopt for the purposes of this report. The applicant's proposal description should be read in conjunction with this report. In summary the application is for the establishment and operation of solar panel farm and earthworks / dune modification.

Solar Panel Farm

The proposed solar panel farm will see 32.22 Hectares covered by solar PV modules on a 20 degree angle, north-facing direction that will remain stationary (instead of track the sun). This will see a total of 6 or 7 inverter stations, a total of 444 arrays, and 52,000 solar panels with a maximum height of 2.29m, which are split as follows:

- 372 arrays of 128 panels in each array.
- 72 arrays of 64 panels in each array.

The solar panels are split into 'string tables' of 28 modules, with each of the string tables being separated by 6.7m from each other.

The total capacity of the proposed solar panel farm equates to 31.334MWp using a 600 watt panel. The proposal will also consist of private access ways that will be utilised to access all the solar panels for maintenance and construction purposes (see figure 1). The solar farm will be connected to the national grid. This will be done through underground connections and cables that will lead to Bergin Road to connect back into the national grid.

The application site will be enclosed with a 2.1m security fence, to allow for the proposed solar farm to be secured at all times, while being permeable to allow for planting to be visible. Planting is proposed to aid in screening the solar farm from being completely visible from neighbouring properties and the wider environment, this is discussed further below. A medium voltage room (MV room) will also be proposed within a 9m x 14m shed with a height of 3.6m.

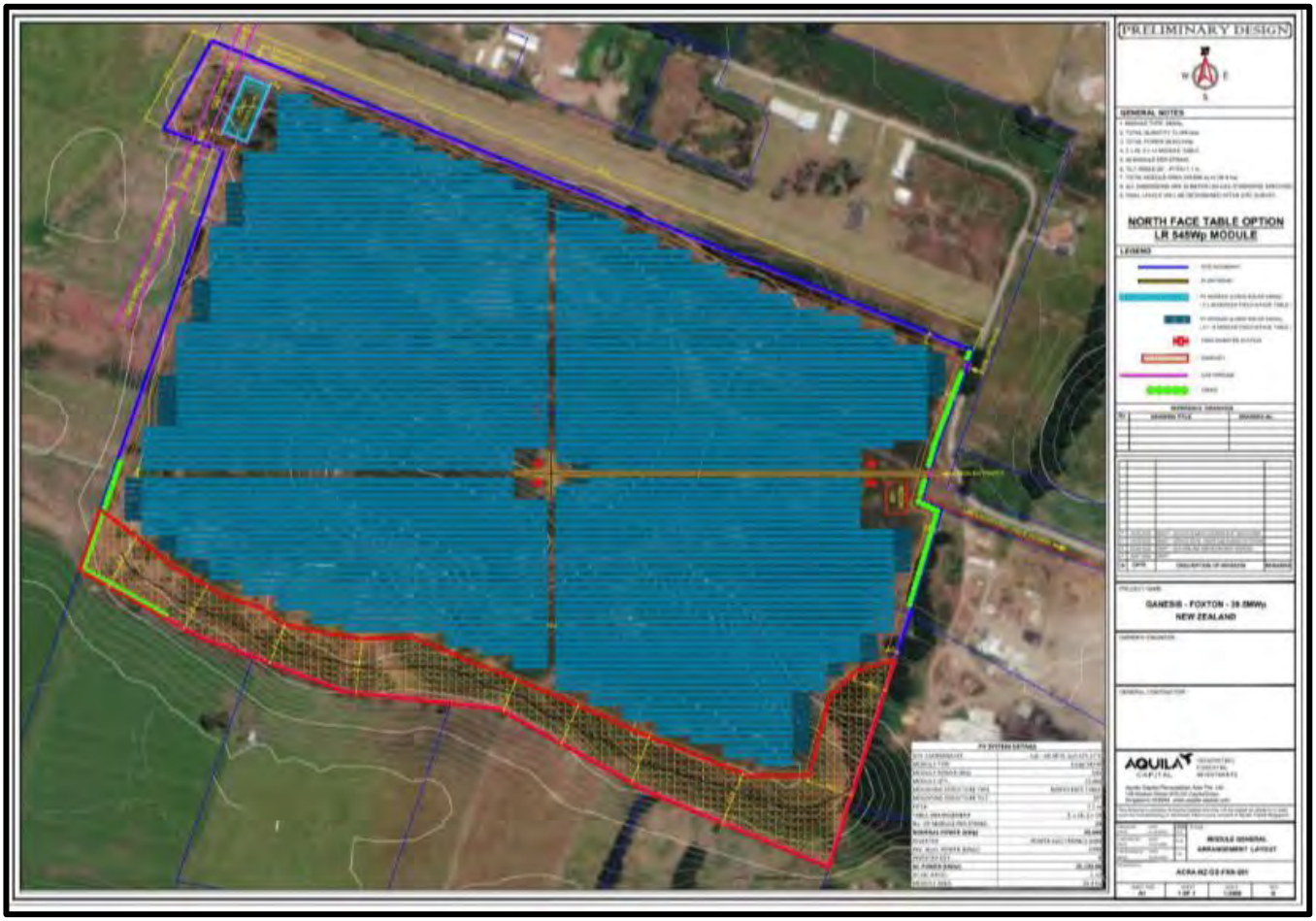


Figure 1: Proposed Site Plan

The proposed solar panel farm will see planting around the eastern and western boundary of the application site. Simon Cocker, Landscape Architect produced a landscaping report. Mr Cocker recommends that the vegetation screen planting will be 3.0m in width and maintained to a maximum height of 3.0m to ensure that adequate visual screening of the farm is provided, while not interfering with the solar farm activity itself. This planting will comprise of the following:

Species	Common name	grade	% mix	spacing
Coprosma areolata	Thin leaf coprosma	1L	5	1.4
Kunzea amathicola	rawiwitoa	0.5L	50	1.4
Leucopogon fasciculatus	mingimingi	1L	10	1.4
Phormium tenax	harakeke	1L	20	1.4
Pseudopanax crassifolius	horoeka	1L	10	1.4

Figure 2: Proposed planting

Earthworks

The application also consists of an earthworks component that is necessary to recontour the application site to allow for a sufficient building area for the solar panel farm. The site consists of a number of large dunes, most notably are the dunes located to the south and the west of the site which are measured at 20m in height (see figure 3). The earthworks that are being proposed will see the large scale land disturbance span across 28.44 hectares. The application makes mention of a cut volume of 207,424m^3, and 152.024m^3 of fill volume, which would equate to a net 55,4000m^3 of cut to be undertaken. The applicant has confirmed that these numbers are incorrect and that no material will leave the application site, but will be spread evenly across the site provide for a more suitable building platforMs The applicant obtained Resource Consent from Horizons Regional Council on 19th August 2022 for large scale earth disturbance under One Plan Rule 13-2 (APP-2022203850.01).

While the proposed earthworks will see extensive modification to the application site, the largest and most prominent dunes along the southern boundary and west of the application site will be completely retained (see figure 3). This western dune marks the start of the dune formation heading towards the coast and raises into the property Part Lot 2 DP 2279. The application originally proposed to remove the large dune located at the western end of the application site. After consideration was given to the potential effects that this might have, and in consultation with Iwi, the application was revised to retain both the southern dune formation and the western dune (see figure 3).

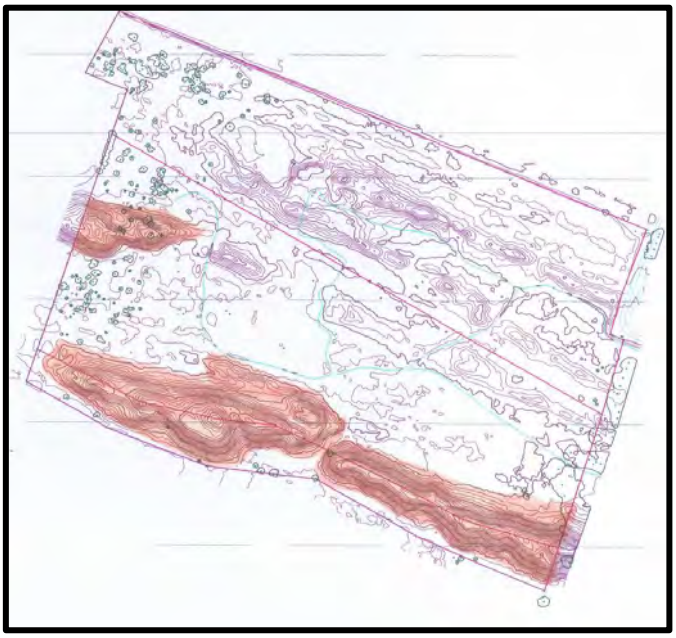


Figure 3: Large dunes on application site

The earthworks are proposed to be undertaken in 7 stages between early September to early December 2022 (see figure 4).

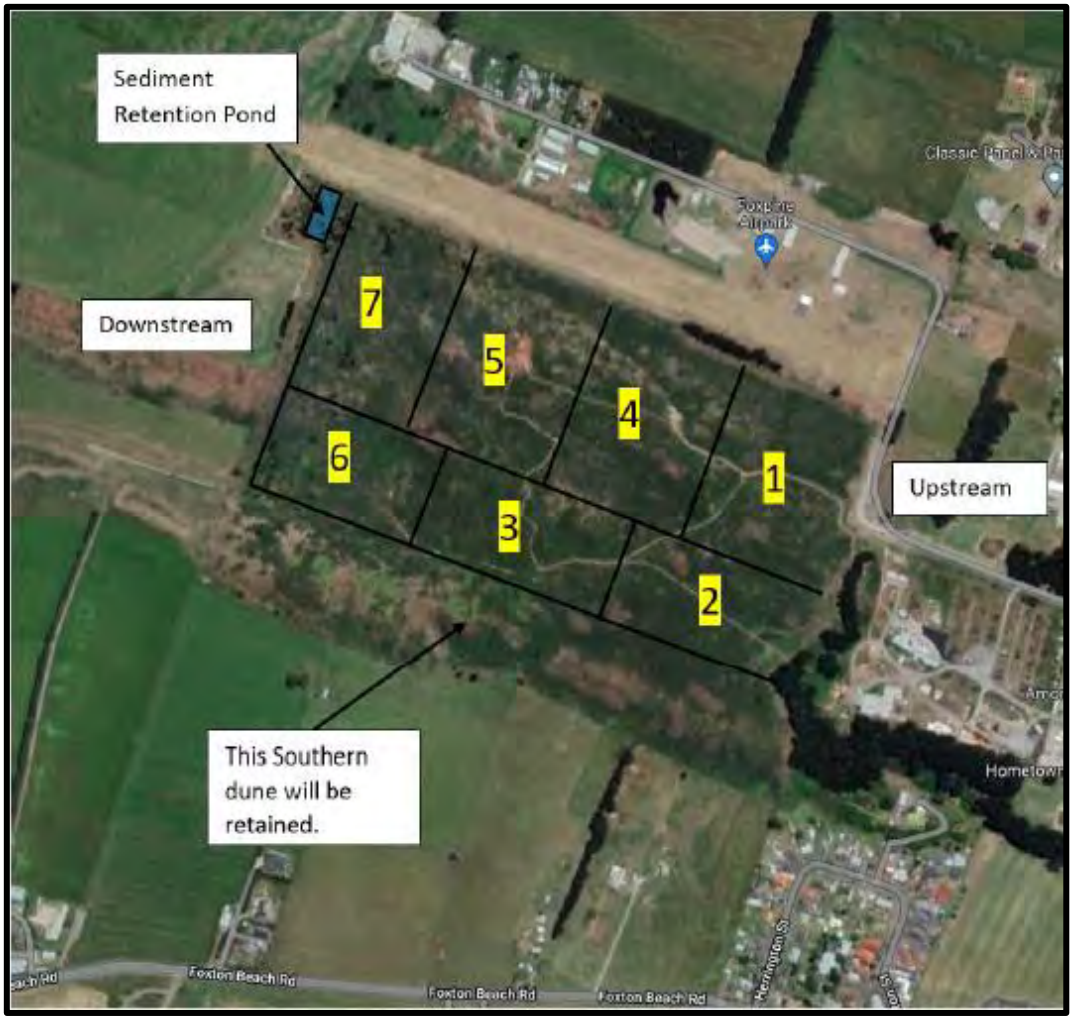


Figure 4: Proposed staging of works

Section 91

On the 24th May 2022 a letter was sent to the applicant explaining that under Section 91 of the Resource Management Act 1991, reasonable grounds to believe that additional Resource Consents were required.

Horizons (Manawatu-Whanganui) Regional One Plan

This expressed the need for a Resource Consent from Horizons Regional Council for one of the following rules:

- Rule 13-2 – Consent is required to undertake large-scale land disturbance

- Rule 13-8 – Activities within 'at-risk' habitats
- Rule 13-9 – Activities within 'rare' habitats and 'threatened' habitat

An assessment to determine if the application site was within an 'at-risk', 'rare' or 'threatened' habitats.

Operative Horowhenua District Plan

It was also expressed that a consent was required under District Plan Rule 19.8.1(b) and 19.3.1(a) for earthworks and dune modification within the Foxton Dunefield Landscape Domain due to a non-compliance with 19.6.13(a)(iii).

It was expressed that both of these earthworks / land-disturbance consents were required to enable Council to adequately assess the environmental effects of the proposal.

On the 21st June 2022, Emily Burns of the Catalyst Group sent a memorandum addressing District Plan Rule 19.6.13(a)(iii), but did not address Rule 19.8.1(a) or the interests of the Department of Conservation.

On the 6th July 2022, Ms Burns circulated confirmation e-mail from Lorraine Cook of Horizons Regional Council that the site does not meet the definition of any habitat within Schedule F of the Horizons One Plan. This confirming that the land disturbance consent from Horizons Regional Council would be processed under Rule 13-2 as a Controlled Activity. Although Ms Burns first application lodged with Horizons Regional Council was returned pursuant to Section 88 of the Act as incomplete, this was returned due to not providing a sediment erosion control plan with the application.

On the 6th July 2022, after following confirmation from Horizons Regional Council that the application would be considered a Controlled Activity and evidence that the applicant had lodged a new consent with a sediment erosion control plans, it was deemed appropriate to remove the Section 91 hold off this consent application.

The application for Horizons Regional Council resource consent was subsequently granted on 19th August 2022 (APP-2022203850.01).

Section 92 Request

On the 18th July 2022 a request for further information was sent to Ms Burns pursuant to Section 92(1) of the Act. This request information can be summarised to the following points:

- An assessment in relation to the glint and glare effects of the proposal in relation aircraft utilising the aerodrome and parties within the vicinity of the proposal.
- An assessment against Rule 19.8.1(b) and the interests of the Department of Conservation where earthworks / dune modification is to be undertaken to the west of State Highway 1.
- Providing any consultation with the Department of Conservation that has been undertaken in relation to the dune modification and earthworks.
- Providing any further written approvals / consultation that has been undertaken.
- Providing an amended Assessment of Environmental Effects.

As part of the applicant's response to the above Section 92 request, a glint and glare report produced by ITP was produced. The applicant demonstrated that Consultation with the Department of Conservation was undertaken, who did not wish to provide written approval for the proposal for the proposal. A letter dated 26th August 2022 (received 29th August 2022) specified the following concerns that the Department of Conservation had, and reasons for not providing written approval:

- *Insufficient information has been supplied to enable me to assess the effects of the proposal on the Department of Conservation (Department)'s interests.*
- *Herpetological values, and their future management, including any Wildlife Act requirements.*
- *Botanical values.*
- *Details on iwi consultation, and the outcome of these discussions.*
- *Context around the value of these dunes in the surrounding landscape, including their landscape and geomorphological importance.*
- *Archaeological values/ plan for discoveries.*

An assessment of these points raised are specified in Section 6.4 of this report.

The applicant also supplied this information in an updated AEE.

2. SITE DESCRIPTION

The applicant's AEE also includes a description of the site and its immediate surroundings. Following a site visit, I consider that this description is accurate, and it should be read in conjunction with this report. In summary, the application site is located within the Rural Zone of the Operative Horowhenua District Plan and is situated within the Foxton Dunefields Landscape Domain. The application site is situated within an indicative Ponding Hazard Overlay area within Council's GIS (blue) and is located to the north of an identified growth area.

The application site consists of 35.4 hectares in area that is an old forestry block, which has subsequently been deforested. There are a number of tracks and overgrown shrubbery situated on the application site. As mentioned in Section 1 of this report, the site has a number of dunes that are situated throughout the site, but with the dominant 20m high dunes being situated along the southern boundary and the western boundary (see figure 3). The application site is surrounded by a number of different zones and land-uses with:

- Rural Residential Blocks - These are situated at the northern end of Bergin Road and Maury Place with a single block being located at 24 Bergin Road.
- Industrial Activities – There are a number of industrial activities located down the southern portion of Bergin Road, east of the application site.
- Residential – There are a number of residentially zoned and developed properties that are located to the south east of the application site, off Herrington Street.
- Rural Activities – There are a number of farming activities located to the south, west and north that range in lot sizes from 5 hectares to 41 hectares.
- Aerodrome – Directly to the north of the application site lies the Foxton Aerodrome which owns the accessleg to the application site. This aerodrome has an area of 12.011 hectares.

The application site is held on two records of titles over three allotments. These being as follows:

- WN93A/818 – Lot 3 and 4 DP 27011
- WN37A/738 – Lot 7 DP 68629.

Upon a review of these records of titles, the following interests are of relevance to this application:

- Easement B106937.5 – provides a right of way easement over Lot 6 DP 68629, the Foxton aerodrome to Lot 7 DP 68629.
- Easement 753554 – provides an easement of Gas over the gas pipe main. This easement is where the sediment pond is proposed to be located.

Figure 5: Application site with surround sites and zonings

Figure 6: Large southern dune formation when viewed from the centre of the application site

3. RELEVANT PLANNING RULES AND REGULATIONS

District Plan

The application site lies within the Rural Zone of the District Plan and is shown to be subject to the following District Plan notations:

- Foxton Dunefield Landscape Domain

The proposal requires resource consent for the District Plan non-compliances outlined in the table below. In addition, to determine the activity status of the proposal, it must first be assessed against the relevant rules and conditions of the District Plan. An assessment of this can be found in the Table below:

Overview of Rule	Assessment
Rule 19.4.1 – General (a) Any activity that is not a permitted, controlled, restricted discretionary, or non-complying activity is a discretionary activity.	The proposal for the establishment and operation of a renewable energy development or a solar panel farm is an activity not listed as a permitted activity, controlled activity, restricted-discretionary activity or non-complying in the Operative Horowhenua District Plan.
19.4.6 – Network Utilities and Electricity Generation (a) Lines and support structures (including towers, masts and poles) for conveying electricity at a voltage exceeding 110kV.	The installation will involve the conveying of electricity in exceedance of 110kV.
19.6.3 - Maximum Building Height (b) No part of any other building shall exceed a height of 15 metres.	**Will Comply –** No building as part of the proposal will be in exceedance of 15m in height
19.6.5 – Building Setbacks from Boundaries and Separation Distances (a) All buildings shall comply with the following setbacks:	**Will Comply –** No building will be situated within 10m from Bergin Road or any other site boundary. There are no banks or streams located within the application site and no

(i) 10 metres from any District road boundary; (ii) 15 metres from any State Highway boundary; (iii) 10 metres from any other site boundary; (iv) 15 metres from any bank or stream edge; (v) 20 metres from the bed of any water body listed in Schedule 12 – Priority Water Bodies.	building will be situated within 20m of any body of water listed in Schedule 12 of the Operative District Plan.
19.6.8 – Noise (a) Noise from any activity shall not exceed the following limits when measured at, or within, any point within any other site: (i) On any day - • 7.00am – 7.00pm: 55dB LAeq (15mins) • 7.00pm – 10.00pm: 50B LAeq (15mins) • 10.00pm – 7.00am: 40dB LAeq (15mins) • □ 10.00pm – 7.00am: 65dB LAmax	**Will Comply –** Rule 19.6.8(d)(iv) precludes Rule 19.6.8(a) from being applicable to construction noise, maintenance and demolition work. The operation of the solar panels farm will adhere to the noise standards specified in Rule 19.6.8(a).
19.6.8 – Noise (c) Construction, maintenance and demolition work shall be measured, assessed, managed and controlled in accordance with the provisions of NZS 6803:1999 Acoustics – Construction noise.	**Will Comply –** The construction, maintenance and demolition work will comply with NZS 6803:1999 Acoustics – Construction noise.
19.6.14 – Sites of Significance to Tangata Whenua (a) No activity or development shall modify, demolish or remove any site of significance to Maori where such site has been	**Will Comply –** The application site has not been identified as being a site of significance to Maori to Council or recorded by Council in a register.

identified to Council and recorded by the Council in a register of sites prior to the time that any activity or development is proposed.	Conditions have been recommended to ensure that in the event of an archaeological site, waahi tapu or koiwi being discovered or disturbed during the activities proposed, the Consent Holder must immediately cease work and contact local iwi (additional detail of conditions outlined in Section 9 of this report).
19.6.13 – Earthworks-Specific Landscape Domains (a) Earthworks, other than cut for a building platform, on land that is not an Outstanding Natural Landscape and Feature, shall not exceed the following: (iii) Foxton Dunefields Landscape Domain • 3 metres (cut or fill) measured vertically • Where earthworks exceed 3 metres (cut or fill) measured vertically, those earthworks shall not exceed 5 metres (cut or fill) measured vertically and shall not exceed a distance of 50 metres in continuous horizontal length. • Where earthworks are to be undertaken on a dune, the vertical height of the dune, or any part of that dune, prior to the earthworks shall be no greater at any point than 10 metres from toe to summit.	**Does not Comply –** The proposal will see earthworks being undertaken that will have more than 3m cut and fill, over a greater horizontal distance of 50m. Earthworks will also be undertaken on dunes over 10m in height.
19.6.19 – Surface Water Disposal (a) All activities shall make provision for the management of stormwater as means of dealing with water quantity and water quality to avoid significant adverse effects or nuisance.	**Will Comply –** The proposal will dispose of all stormwater within the site boundary.

I consider the establishment and operation of the proposed solar panel farm to be a Discretionary Activity under Rules 19.4.1(a) and 19.4.6(a) of the District Plan.

I consider the proposed earthworks within the Foxton Dunefields Landscape Domain to be a Restricted Discretionary Activity under District Plan Rule 19.3.1(a). The matters of discretion which Council is restricted to and non-notification clauses are specified in Rule 19.8.1(a) which reads as follows:

19.8.1 Non-Compliance with Permitted Activity Conditions (Rule 19.6) and Chapters 21, 22, 23 and 24 (Refer Rule 19.3.1)

(a) Matters of Discretion

> *(i) Avoiding, remedying or mitigating of any effects deriving from non-compliance with the particular condition(s) that is not met, except where specifically identified in other rules below.*

(b) Non-Notification

Where a resource consent application for earthworks in the Foxton Dunefields Landscape Domain is subject to Rule 19.3.1 due to a failure to comply with Rule 19.6.13, the Department of Conservation must be notified where the earthworks activity is to be undertaken west of State Highway 1, but otherwise, pursuant to section 77D of the RMA, such an application shall not be subject to limited notification and shall not be publicly notified, except where:

(i) The Council decides special circumstances exist (pursuant to Section 95A(4) or

(ii) The applicant requests public notification (pursuant to 95A(2)(b)).

Rule 19.8.1(b) was a result of an environment court mediation of PC22 – Outstanding Natural Landscape and Features. Section 77D of the Resource Management Act 1991 cannot require limited notification of a specific party. Council has reviewed this rule, and it has been determined that it is to be interpreted that the Department of Conservation (DOC) should be made aware of the application (via sending formal notice the consent application has been received and along with a copy of the application). There rule therefore does not require the decision maker to "notify" DOC for the purpose of Section 95B of the Resource Management Act 1991. On the 5th July 2022, DOC were circulated a copy of the application for earthworks, and therefore were made aware of the earthworks application.

Overall, the proposal is deemed to be a **Discretionary Activity**.

District Plan Change

There are no District Plan changes of relevance to this application.

National Environmental Standards
The proposal does not require assessment under any National Environmental Standards.

Other Resource Consents
The application required a resource consent under the Horizons Regional Councils One Plan in relation large scale land disturbance under Rule 13-2 of the One Plan. This consent was granted as a Controlled Activity by the Horizons Regional Council on the 19th August 2022 (APP-2022203850.01).

4. PERMITTED BASELINE

The permitted baseline test has been defined by case law as comprising non-fanciful (credible) activities that would be permitted as of right by the plan in question (Operative Horowhenua District Plan).

Using the permitted baseline test, Council has the discretion to disregard any effects that could be established from that of a permitted activity. It is only the adverse effects over and above those forming a part of the baseline that are relevant when considering who is 'affected' and whether effects are considered to be more than minor.

No solar panel farm as an activity can be undertaken as a permitted activity under the Operative Horowhenua District Plan. Although no permitted baseline can be established in relation to the solar panel farm, earthworks within the Foxton Dunefield Landscape Domain are provided for as a permitted activity subject to compliance with Rule 19.6.13(a)(iii). Earthworks are permitted that can meet the following requirements:

- 3 metres (cut or fill) measured vertically
- Where earthworks exceed 3 metres (cut or fill) measured vertically, those earthworks shall not exceed 5 metres (cut or fill) measured vertically and shall not exceed a distance of 50 metres in continuous horizontal length.
- Where earthworks are to be undertaken on a dune, the vertical height of the dune, or any part of that dune, prior to the earthworks shall be no greater at any point than 10 metres from toe to summit.

Therefore, earthworks that would be undertaken as part of the proposal that do not exceed 3 metres (cut or fill) and are not undertaken on a dune with a height greater than 10m would be considered permitted. This baseline is relevant to considering what earthworks effects could reasonably be anticipated as a Permitted Activity.

5. NOTIFICATION ASSESSMENT

Council must assess any resource consent application under section 95 of the Resource Management Act 1991 to determine whether a resource consent application should be notified. The Resource Management Act 1991 details a four-step process that must be followed and triggers or precludes notification of applications in certain circumstances. The sections below follow the four-step process for public notification (under section 95A) and limited notification (under section 95E).

5.1 - Public Notification Steps Under Section 95A

Pursuant to section 95A of the Resource Management Act, this section follows the four-step process to determine if public notification is required.

Step 1 - Public notification is mandatory in certain circumstances
Public notification is mandatory in certain circumstances:

Has the applicant requested public notification?	No
Is public notification required under s95C?	No
Is the application made jointly with an application to exchange recreation reserve land under s15AA of the Reserves Act?	No

Public notification is not mandatory under step 1.

Step 2 - Public notification is precluded in certain circumstances
If public notification is not required under step 1 it may be precluded in certain circumstances (unless special circumstances apply under step 4):

Are all activities in the application subject to a rule in a Plan or National Environmental Standard precluding public notification?	No
Is the application for one or more of the following (but no other) activities? ▪ A controlled activity ▪ A boundary activity with a restricted discretionary, discretionary or non-complying activity status	No

The proposal consists of more than one activity. While the provisions specify that resource consents for earthworks are precluded from public notification, each of the each of the activities are not subject to public notification preclusion. Therefore, the proposal is not precluded from public notification in accordance with Section 95A(5)(a) of the Act.

Public notification is not precluded.

Step 3 - Public notification is required in certain circumstances

If public notification precluded under step 2, public notification may be required in certain circumstances:

Is any activity in the application subject to a rule in a Plan or National Environmental Standard that requires public notification?	No
Does the activity have, or is likely to have, adverse environmental effects that are more than minor in accordance with s95D?	No (see assessment below)

Considerations pursuant to Section 95D:

Public notification is required under step 3 if the activity will have or is likely to have adverse effects on the environment that are more than minor.

In considering if the adverse effects on the environment are more than minor, the effects on persons who own or occupy the land in, on, or over which the activity will occur; or any land adjacent to that land must be disregarded. I have therefore disregarded the effects on the persons who own or occupy the following properties in making an assessment under s95D:

- Bergin Road – Lot 2 DP 68629 (RT WN37A/733),
- Bergin Road – Lot 1 DP 68629 (RT WN37A/732),
- 11 Bergin Road – Lot 1 DP 87344 (RT WN54D/827),
- 5-15 Bergin Road – Lot 2 DP 87344 (RT WN54D/828),
- 13 Bergin Road – Lot 1 DP 31738 (RT WN8B1005),
- 15 Bergin Road – Lot 1 DP 40948 (RT WN12D/39),
- 5 Bergin Road – Lot 3 DP 87344 (RT WN54D829),
- Victoria Street – Lot 2 DP 70624 (RT WN38D/720),
- 7 Bergin Road – Part Section 467 TN OF Foxton (RT 642552),
- 1 Bergin Road – Lot 1 DP 70624 (RT WN38D/719),
- 186 Wylie Road – Lot 1 DP 42119 (RT WN13D/1),
- 24 Bergin Road – Lot 1 DP 79277 (RT WN45D/560),
- 41 Bergin Road – Lot 1 DP 48447 (RT WN18D/1210),
- 41 Bergin Road – Part Lot 2 DP 28149 (RT WN18D/1211),
- 29A Bergin Road – Lot 1 DP 393790 (RT 375159),
- 43 Bergin Road – Part Lot 2 DP 31963 (RT WN45D/561),
- 62 Foxton Beach Road – Part Lot 1 DP 59838 (RT WN43A/799),
- 84 and 92 Foxton Beach Road – Lot 1 DP 311167 (RT 43950),
- 25 Bergin Road – Part Lot 2 DP 27011 (RT WN54D/830),
- 124 Wylie Road – Part Lot 2 DP 22791 (RT WN37A/742),

- Bergin Road – Lot 3 DP 68629 (RT WN37A/734),
- Bergin Road – Lot 4 DP 68629 (RT WN37A/735),
- 27 Bergin Road – Lot 5 DP 68629 (RT WN37A/736),
- 27 Bergin Road – Lot 6 DP 68629 (RT WN37A/737),
- 27 Bergin Road – Lot 10 DP 68629 (RT WN37A/741),
- 45 Bergin Road – Lot 3 DP 31963 (RT WN8D/933),
- 25A Herrington Street – Lot 32 DP 17402 (RT 523331),
- 14 Foxton Beach Road – Part Lot 4 DP 2590 (RT WNE3/762),
- Foxton Beach Road – Lot 3 DP 59838 (RT WN31B/168); and
- Foxton Beach Road – Lot 2 DP 59838 (RT WN31B/169)

Effects on Rural Amenity Values

The application site is located in the Foxton Dunefields Landscape Domain, this is characterised by the dissected parabolic dunefields, large areas of pastoral grazing and pine forestry, resulting in an active topography with diverse vegetation cover as specified in Appendix 1 of Chapter 2 of the Operative District Plan. The application site itself is heavily modified, being previously used as a forestry block that has since been harvested. The site currently has overgrown vegetation that spans that entire application site since the cessation of the historic forestry activity.

The applicant has provided a landscape report, produced by landscape architect Simon Cocker. This provided an assessment of the proposal, including the proposed earthworks and the visual effects of the operation of the solar panel farm on the rural environment. Mr Cocker specifies that while being situated within the Rural Zone, the surrounding properties to the east down Bergin Road are industrial activities. It was also specified that the application site itself was already heavily modified with extensive overgrown vegetation being present all across the site The proposed facility will be of a scale and character that will contrast with the existing landscape character with low height of the building and the inclusion of the proposed planting around the exterior of the site resulting in the proposal not detracting from natural character or landscape values.

An independent peer review of Mr Cocker's landscape assessment was undertaken by Emma McRae, Associate Principal Landscape Architect at Boffa Miskell. In this review, Ms McRae stated that following a site visit being undertaken, she was generally in agreement with the overall findings of the assessment. Ms McRae did note that there were some aspects of Mr Cocker's assessment that she was not agree with, most notably the potential landscaping effects relating to the removal of the western dune. Ms McRae concluded that Mr Cocker's assessment did not provide enough consideration in relation to the removal of the western dune

landform and that overall the landscaping effects with the removal of the western dune being low-moderate, instead of low as was assessed by Mr Cocker. I concur with Ms McRae's review of Mr Cocker's landscape assessment in this regard.

Undertaking of the earthworks will see the overgrown vegetation being cleared with a number of medium sized dunes being levelled to undertake the operation of the proposed solar panel farm. The proposed planting along the entire exterior of the application site, including tree planting will ensure that the removal of these medium sized dunes located in the centre of the application site will not be discernible beyond the adjacent sites. The large dunes located along the southern boundary of the application site will remain and will screen the proposal from being visible form Foxton Beach Road. Earthworks will be undertaken on the large dune on the western boundary of the property which will result in a gradual slop of the dune up to the existing peak. This western dune marks the start of the next dune formation in a western direction. The proposed earthworks on this western dune will not result in the dune formation being intermittent or having a break in the formation, but will see the start of this dune formation shifting.

Therefore, as the western dune is proposed to remain and taking into consideration the points specified above, the proposal will have no more than minor effects on the character of the rural environment beyond the adjacent properties.

Noise Effects

There are two different categories of noise that should be addressed from the proposal, with these being construction noise and operational noise of the solar panels. Heavy machinery such as excavators and dump trucks are expected during the construction phase of the proposal, including earthworks. This heavy machinery will be time restricted to not create noise on the residential properties in the wider environment. The operation of these machines and trucks are expect to be similar in sound to the operation of industrial activities operating in the adjacent industrially zoned sties down Bergin Road. It should also be noted that the construction of the proposal and the earthworks will be temporary, which is anticipated to be completed within 3-4 months of works starting. The AEE provided specifies that construction work will take place during daytime, with the large southern dune acting as a sound barrier in relation to sound traveling southward.

The solar panels themselves are stationary, resulting in no hydraulics being used for the operation of the panels. The operation of the solar panel farm will comply with the provisions of the District Plan. Therefore, the proposal will no more than minor noise on the wider environment.

Glint and Glare

As a response to the Section 92 request for further information, the application supplied a glint and glare report produced by ITP. This report looked at the glint and glare effects of 19 different points within a 2km radius, with Point OP1, OP2, OP3 and OP 16 being on adjacent sites and therefore not considered in this Section 95A assessment. The report indicated that glint and glare beyond a 2km distance was unlikely and was therefore not assessed. This report indicated that all points assessed, including flight paths did not receive more than 20 minutes of glare in any single day, with this most notably occurring in the early morning. This glare assessment resulted in only the following observation points receiving glare:

- **OP 6** – 2723 minutes 'yellow' glare per year – up to 14 minutes of glare between 7.30am and 8.30am from mid-August to late April.
- **OP 7** – 2762 minutes 'yellow' glare per year – up to 15 minutes of glare between 7.30am and 8.30am from early January to late April and early August to late November.
- **OP 8** – 2623 minutes 'yellow' glare per year – up to 15 minutes of glare between 8.00am and 8.30am from mid-January to early May; and up to 15 minutes of glare between 7.30am and 8.30am from early August to mid-November.
- **OP 9** – 2361 minutes 'yellow' glare per year – up to 15 minutes of glare between 8.00am and 8.30am from early February to late April; and up to 15 minutes of glare between 7.30am and 8.30am from mid-August to late November.
- **Wylie Road** – 3257 minutes 'yellow' glare – up to 20 minutes of glare between 8.00am and 8.30am from mid-March to late June; and up to 20 minutes of glare between 7.30am and 9.00am from late June to late September.

All the above observation points are within a close proximity to one another on Wylie Road. The landscaping report produced by Mr Cocker specifies that landscaping and planting will be located along the western site boundary which will act as a screen to majority of the indicted glare that would occur on Wylie Road and OP 6, OP 7, OP 8, and OP 9. Observation points to the south (Foxton Beach Road) and south east (Victoria Street) were not assessed due to dense tree and the large dune to remain on-site acting as a screen from the potential glint and glare effects. Ms McRae of Boffa Miskell undertook an independent review of the glint and glare report produced by ITP in relation to properties. Ms McRae specified that it was not within her technical capacity to comment on the flight path of aircraft. Ms McRae specified that the mitigation planting along the western boundary in place will mitigate the potential glare on Wylie Road. Therefore, for the reasons specified above, the proposal will have no more than minor glint and glare effects on the wider environment.

Figure 7: Observation points made by ITP in glint and glare assessment

Reverse Sensitivity Effects

Reverse sensitivity is the term used to describe the sensitivity of some activities to other lawfully established activities. This arises when a new use is proposed for land in circumstance when an established use adjoining that land is producing adverse effects. Beyond the adjacent properties that reverse sensitivity needs to be considered would be in relation to the industrial activities on Bergin Road, State Highway 1, rural activities, residential activities and the operation of the Foxton race course. The proposal is screened from being visible from the local roads and State Highway 1. The proposal is not anticipated to have any effects on the rural grazing activities, with any potential reverse sensitivity effects on the residential activities within the wider environment resulting from potential glare, which has been assessed above. Therefore, the proposal will no more than minor reverse sensitivity effects on the wider environment.

Stormwater Effects

Stormwater runoff from the solar farm is generated primary from rain that falls on the inverter pad and solar arrays themselves. The stormwater requirements of the District Plan will be complied with, and any specific stormwater design will be addressed through the building consent process. During heavy duty rain events, stormwater is expect to be retained in the

proposed pond in the northern corner of the application site. Although it is noted that the site is situated within a ponding hazard area which may result in a high water table across the application site, the proposal will have no more than minor stormwater effects on the wider environment.

Cultural Effects

On the 31st August 2022 a site visit of the application site was undertaken with a representative of Muaūpoko Tribal Authority (MTA), Dean Wilson. Mr Wilson explained during the site visit that the largest dune formations often were used by local Iwi to travel from the ranges to the coastal. It was also explained that depending on the significance of a person, they might be buried on the western side of dunes so that the wind would allow them to be continually buried. This would mean that the proposed earthworks on the larger western dune has the potential to have human remains. As a result of this knowledge, the Applicant has amended the original application to ensure the large western dune would not be disturbed and remain fully intact.
On Monday 10th October 2022, Di Dump, CEO of MTA expressed support of the proposal in that the western dune and the southern dune are retained and that the consideration be given to a discovery protocol would be appropriate for the remainder of the site.

The applicant has agreed to ensuring an accidental discovery protocol is implemented to manage the potential risks and effects associated with land disturbance on the site. In addition, works will immediately stop if any findings on the site are revealed and iwi representatives will be contacted as soon as possible. A copy of the finalised Erosion and Sediment Control Plan (once this has been finalised) will also be provided to iwi and local hapū groups. Lastly, no earthworks will begin until local iwi and hapu groups will have an opportunity to perform a karakia to bless the project site prior to earthworks.

It should be noted the application site has not been identified as being a site of cultural or archaeological significance on Council's GIS maps being a reflection of the District Plan information.

Based on the assessment above and the information provided, it is considered the proposal will have no more than minor cultural effects.

Public notification is not required under step 3.

Step 4 – Public notification is required in special circumstances

If public notification is not required under step 3 public notification may still be warranted where there are special circumstances:

Do special circumstances exist that warrant public notification?	No

Special circumstances have been defined as circumstances that are unusual or exceptional but may be less than extraordinary or unique. This land use consent application relates to the establishment and operation of a new solar panel farm which is contributing to the sustainable and renewable energy direction of New Zealand. I therefore do not consider there to be any unusual or exceptional circumstances that warrant public notification of this proposal.

Conclusion
Public notification is not required.

5.2 - Limited Notification Steps Under Section 95B

As determined in section 5.1 of this report, public notification is not required. Pursuant to section 95B of the Resource Management Act, a four-step process must therefore be followed to determine if limited notification is required.

Step 1 – Certain affected groups/persons must be notified
Limited notification is mandatory for certain groups/persons:

Are there affected customary rights groups?	No
Are there affected customary marine title groups (for accommodated activities)?	No
Is the proposal on or adjacent to, or may affect, land that is subject to a statutory acknowledgement and whether the person to whom the statutory acknowledgement is made affected under section 95E?	No

Limited notification is not required under step 1.

Step 2 – Limited notification is precluded in certain circumstances
Limited notification to any other persons not referenced in step 1 is precluded in certain circumstances (unless special circumstances apply under step 4):

Are all activities in the application subject to a rule in a Plan or National Environmental Standard precluding limited notification?	No
Is the application for a controlled activity (other than a subdivision) under the District Plan but no other activity?	No

Limited notification is not precluded under step 2.

Step 3 – Certain other persons must be notified

If limited notification is not precluded under step 2, limited notification is required for any persons found affected under s95E:

For 'boundary activities' are there any owners of an allotment with an 'infringed boundary' considered 'affected' under s95E?	No (see below assessment)
For all other activities, are there any affected persons in accordance with s95E?	No (see below assessment)

In accordance with s95E are there any affected persons?

Section 95E(3)(a) stipulates that those individuals who give written approval to a proposal cannot be considered to be an "affected party". The following persons have given written approval to the application:

- [redacted] – Lot 2 DP 68629 (RT WN37A/733).
- [redacted] – Lot 9 DP 68629 (RT WN37A/740) and Lot 1 DP 68629 (RT WN37A/732).
- [redacted] – Lot 1 and 2 DP 87344 (RT WN54D/827 and WN54D/828), Lot 1 DP 31738 (RT WN8B1005), Lot 1 DP 40948 (RT WN12D/39), Lot 3 DP 87344 (RT WN54D829), Lot 2 DP 70624 (RT WN38D/720); and Part Section 467 TN OF Foxton (RT 642552).
- [redacted] – Lot 1 DP 70624 (RT WN38D/719).
- [redacted] – Lot 1 DP 42119 (RT WN13D/1).
- [redacted] – Lot 1 DP 79277 (RT WN45D/560).
- [redacted] – Lot 1 DP 48447 (RT WN18D/1210), Part Lot 2 DP 28149 (RT WN18D/1211); and Lot 1 DP 393790 (RT 375159).
- [redacted] – Part Lot 2 DP 31963 (RT WN45D/561).
- [redacted] Part Lot 1 DP 59838 (RT WN43A/799) and Lot 1 DP 311167 (RT 43950).
- [redacted] Northland Waste Limited – Part Lot 2 DP 27011 (RT WN54D/830) – Occupiers

In accordance with section 95E, I have considered whether the proposal could adversely affect any other persons. I consider there to be no affected persons as the potential environmental effects will be less than minor for the following reasons:

<u>124 Wylie Road (Part Lot 2 DP 22791) – located to the west of the application site.</u>

- As mentioned in Section 5.1 of this report, there are two different potential noise effects that could arise from the proposal, these being construction noise and operational noise. The

operational noise of the solar farm are specified to meet the requirements of Rule 19.6.8 for noise. The District Plan is considered sufficient to manage the noise effects from the proposal. The solar panels themselves are stationary with no hydraulics, meaning that there operation are quiet. Figure 1 demonstrates the proposed layout, which would see solar panel arrays along the common boundary between the application site and this neighbouring property. The applicant's AEE mentions that there will be a maximum of 63dB from the cooling fans within the converting unit, which will be situated within the centre of the application site to maximise distance from all neighbouring properties. Given the operation of the solar panel arrays have no hydraulics are present on the stationary arrays and the distance from the cooling fans, the proposal will have less than minor operational noise effects on this neighbour.

The other potential noise effects that need to be considered is the construction noise. This neighbouring property is large farming block that is utilised for grazing which is dissected by the large dune dunning parallel to the site. The construction noise will be temporary, with the earthworks and construction of the proposal expected to be completed within 6-7 months. This construction will take place during the day-time as to reduce noise effects at night. The construction noise is anticipated to be typically between 75-80dB at a distance of 50m, but may be 90dB at a distance of 50m when power tools are being used to construct the arrays. Given this neighbouring property being used for rural productive purposes, only the western boundary of the site will be able to distinguish the construction noise. Therefore, the proposal will have less than minor construction noise effects on this neighbouring property.

- As specified above, this neighbouring property has no residential dwelling unit situated on it and is utilised for primary production purposes, mainly grazing. The proposal will consist of a "plant road" around the complete exterior boundary line of the application site, with trees being planted in the south western corner of the application site, which shares a common boundary with this neighbouring property. During the construction and earthworks phase of the proposal, there will be a period of 6-7 months before the 'planting road' and trees have been panted as depicted in figure 1, because of this it is considered appropriate for the planting to be established at a minimum height of 1.5m. The proposed 'planting road' will screen the proposal from largely being visible from this neighbouring property once the construction of the proposal has finished. The applicant provided an assessment of landscape and visual amenity effects produced by Simon Cocker, with VP 2 being from Wylie Road, adjacent to this neighbouring property. Mr Cocker mentions that the proposal will be barely visible from the occupiers to the West once the landscaping and planting along the common boundary is completely grown. Mr Cocker concludes *"that the proposal will have 'low' visual amenity effects during the construction phase of the proposal and 'very low' once the vegetation has been established."* Ms McRae undertook an independent peer

review of Mr Cocker's landscape assessment, who was generally in agreement with Mr Cocker's assessment but specified that the potential effects of the removal of the western dune were overlooked. Given that the proposal will now retain the large dune landform on the western boundary of the site, bordering this neighbouring property, the main concern that Ms McRae raised in relation to this neighbouring property (being the removal of the western dune) is no longer proposed. I concur with Ms McRae's review of Mr Cocker's landscape assessment and the conclusions on the visual amenity effects of the proposal on this neighbouring property. Therefore for the reasons outlined above, including the use of 124 Wylie Road and the existing desegregation of the application site, the proposal will have less than minor visual amenity effects on this neighbouring property.

- The applicant supplied a glint and glare assessment produced by ITP. While no specific observation point was assessed on this neighbouring property, OP 6, OP 7, OP 8; and OP 9 were situated on Wylie Road, to the south of 124 Wylie Road. As specified in Section 5.1 of this report, these observation points were expected to have between 14-15 minutes of glare each day in the early morning throughout various months of the year. This expected glare did not take into consideration the proposed planting along the south-western corner of the application site. This neighbour property also extends to the north, closer to OP 4 and OP 5, which receive no glare, indicating that most glare would be in a south western direction (towards OP 6). Due to the direction of the glare towards OP 6, the proposed planting will help to mitigate these effects to a less than minor degree. Upon review of the glint and glare assessment by ITP, Ms McRae also specified that the planting along the western boundary will mitigate potential glare effects on Wylie Road, and in turn this neighbouring property. The majority of the site is located closer to OP 4, and is therefore not anticipated to have any glint or glare. Due to the rural productive use of the land, with no residential dwelling being situated on it and the reasons specified above, the proposal will have less than minor glint and glare effects on this neighbouring property.

<u>27 Bergin Road (Lot 5, 6 and 10 DP 68629) and Lot 3 and 4 DP 68629 – Located to the north of the application site.</u>

- These neighbouring properties are located to the north of the applications site and are utilised as the Foxton aerodrome and rural production activities. The proposal will be able to comply with the noise standards of Rule 19.6.8 in relation to the operational noise. The applicant's AEE mentions that there will be a maximum of 63dB from the cooling fans within the converting unit, which will be situated within the centre of the application site to maximise distance from all neighbouring properties. Given that the cooling fans are located centrally in the application site and distanced from these neighbouring properties and the solar arrays themselves will comply with the District Plan, the proposal will have less than minor operational noise effects on these neighbouring properties.

The construction of the proposal is expected to be completed within 6-7 months and will include the earthworks and the construction of the solar arrays. There are a number of small man made dunes that are on the boundary of the application site and Lot 6 DP 68629 which will be removed as part of the construction. This construction will typically be between 75-80dB at a distance of 50m with a peak of 90dB at a distance of 50m when power pools are being used for the construction of the arrays. Majority of the proposed construction will take place at a significant distance from these neighbouring properties and will not be discernible over the noise emitted from the industrial activities within the vicinity. There will be small time window where earthworks and construction of the solar arrays closest to the common boundary. Construction noise is specified in District Plan Rule 19.6.8(c) as being managed and controlled by NZS 6803:1999 Acoustics – Construction Nosie, which the proposal will comply with. Given the use of these neighbouring properties and the reasons mentioned above, the proposal will have less than minor construction noise effects on these neighbouring properties.

- The application provided a landscaping report produced by Simon Cocker, with viewpoints 3, 4, 5, 6 and 9 being the view from these neighbouring properties. Currently, the application site overgrown with vegetation, with the large southern dune being the predominant feature when viewed from these neighbouring properties. Mr Cocker specified that *"the site has been extensively modified over many decades and is primarily under dense exotic weeds including gorse, blackberry, and pampas. Some kanuka is evident".* When viewed from these neighbouring properties, the current landscape features on the site are blocked by a small man made dune that runs along the northern boundary, with only the largest dune to the south and west being visible. The larger western dune will not be modified as part of the proposal, with the manmade dune also being removed and replaced by a 'planting road' along the common boundary. The proposal will ensure that the predominant dunes and landscape features along the southern and western boundary will still be visible and not obstructed by the solar farm itself. Ms McRae specified that the potential landscaping and visual amenity effects of the removal of the western dune landform did not have enough consideration in Mr Cocker's assessment. The western dune is to be retained as part of this proposal as therefore making this point obsolete. Ms McRae also considered that the users of this neighbouring property would experience 'moderate' adverse effects as result of the earthworks during the construction period, but would be reduced to 'low-moderate' upon completion. Ms McRae undertook her independent peer review of Mr Cocker's assessment and reached her conclusions on the basis that the western dune was to be removed as part of the proposal. Given that this western dune is to be retained, this will reduce the visual and landscaping effects than what was concluded in Ms McRae's report. I concur with the conclusion made by Ms McRae, but with the retention of both the large southern dune and the large western dune, the proposal will have less than minor visual amenity and landscaping effects on these neighbouring properties.

- These neighbour properties are situated to the north of the application site and have no residential dwelling situated on them. OP 2 and OP 3 in the glint and glare report produced by ITP were assessed on these neighbouring properties. Both of these observation points were assessed has having no glint or glare resulting from the proposal. The glint and glare report also specified that there will be no glint or glare all year round on both the two different flight paths being FP 1 (western approach) and FP 2 (eastern approach) . I concur with the conclusions reached in the glint and glare report by ITP. Due to the findings in the glint and glare report and the use of these properties (aerodrome and rural activities) the proposal will have less than minor glint and glare effect on these neighbouring properties.

<u>45 Bergin Road (Lot 3 DP 31963) – located to the north east of the application site.</u>

- This neighbouring property is situated to the north east of the application site, with no common boundary being shared. The operational noise from the proposal will be able to comply with the District Plan under Rule 19.8.6. The cooling fans is measured to emit 63dBA measured at 10m. The construction noise from the proposal is expected to be completed within 6-7 months. This neighbouring property being situated in the northern end of Bergin Road is measured at 160m at the closest point to the application site. The setback from the application site from this neighbouring property will mitigate any potential construction and operational noise effects to a less than minor degree.

- This neighbouring property has no common boundary with the application site, being separated by 24 Bergin Road, 43 Bergin Road; and Lot 6 DP 68629. This neighbouring property has all of the buildings located at the eastern side of the property, closest to Bergin Road. The proposal will see trees being planted along the eastern boundary of the application site and a 'plant road' being along the northern boundary. When being viewed from the buildings situated on 45 Bergin Road, the application site will largely be screened by the buildings situated at the centre of 43 Bergin Road and the tree line at the western boundary of 41 Bergin Road. There is a small portion of the centre and eastern portion of 45 Bergin Road that will have a clearer view of the application site. The proposed landscaping mitigation will largely screen any potential view of the proposal, post-construction. Leaving only a small portion of 45 Bergin Road having visibility of the application site during the 6-7 month construction period until the vegetation has been established. The assessment of landscape and visual amenity effects report, produced by Simon Cocker concluded that the potential visual effects on the users of Bergin Road will be *"'low' during the construction period (6-7 months), and 'very low' once the vegetation has been established"* and the effects on the dwellings on Bergin Road being nil. I concur with the conclusions reach by Mr Cocker. Therefore, for the reasons outlined above, the proposal will have less than minor visual amenity effects on this neighbouring property.

- The glint and glare report produced by ITP did not have an observation point on this neighbouring property, with OP 19 and OP 15 being the closest. This report anticipated that these observation points were to receive no glare all year around. I concur with the conclusions made by ITP in that no glint or glare will be received by this neighbouring property. Therefore, the proposal will have less than minor glint and glare effects on this neighbouring property.

Part Lot 4 DP 2590, Lot 3 DP 59838, Lot 2 DP 59838 and 25A Herrington Street (Lot 32 DP 17402) – located to the south of the application site.

- These neighbouring properties are located to the south of the application site and are separated by the large dune to remain on the application site. This large dune will act as a barrier for the construction and operational noise from the application site on these neighbouring properties. As no construction works, earthworks or solar arrays will be situated within close proximity to these neighbouring properties, the remaining dune will mitigate any potential noise effects to a less than minor degree.

- These neighbouring properties are located to the south and south east of the application site, being separated by the large dune along the southern boundary of the application site. As this dune is to be retained and will be unmodified, this dune will act as a barrier to these neighbouring properties to the south (Part Lot 4 DP 2590, Lot 3 DP 59838 and Lot 2 DP 59838) resulting in less than minor visual effects on these properties. The assessment of landscaping and visual amenity effects report produced by Mr Cocker concluded that 24A Herrington Street is *"primarily vegetated with exotic trees. It does not contain a dwelling .Activity associated with the proposal within the site will not be apparent from this property and the potential visual amenity effects will be nil."* I concur with the conclusion reached by Mr Cocker. Therefore for the reasons outlined above, the proposal will have less than minor visual amenity effects in relation to these neighbouring properties.

- These neighbouring properties are situated behind the large southern sand dune with a number of large trees obstructing view from 25A Herrington Street. The glint and glare report produced by ITP specified that these properties did not require a glint and glare assessment in that due to these obstructing features (trees and dunes), that very minimal glint or glare from the solar panels could occur in relation to these properties. I concur this these assessment in that the proposal will have less than minor glint and glare effects on these neighbouring properties.

General

- As specified in Section 5.1 of this report, stormwater runoff will primarily occur when rain will hit the solar arrays. The specific stormwater design will be addressed through the building consent process. As the proposed solar farm will be serviced with the necessary

infrastructure to accommodate this level of development, including stormwater, the stormwater effects will be less than minor in relation to all the above neighbouring properties.

Limited notification is not required under step 3.

Step 4 – Limited notification is required under special circumstances

If limited notification is not required under step 3, limited notification may still be warranted where there are special circumstances:

Do special circumstances exist that warrant notification of any persons to whom limited notification would otherwise be precluded?	No

Conclusion

Limited notification is not required.

5.3 – Overall Notification Decision

In accordance with the notification steps identified in section 5.1 and 5.2 of this report, the application shall proceed on a non-notified basis.

6. DETERMINING THE APPLICATION

Section 104 requires that when considering a resource consent application, the Council must - subject to Part 2 - have regard to:

- any actual or potential effects on the environment of allowing the activity
- any measure agreed or proposed by the applicant for the purpose of ensuring positive effects on the environment to offset or compensate for any negative effects;
- any relevant provisions of:
  - a national environmental standard;
  - other regulations;
  - a national policy statement;
  - a New Zealand coastal policy statement;
  - a regional policy statement or proposed regional policy statement;
  - a plan or proposed plan;
- any other matter the consent authority considers relevant and reasonably necessary to determine the application.

6.1 – Section 104(1)(A): Environmental Effects Assessment

Section 104(1)(a) of the RMA states that when considering an application for a resource consent, the consent authority shall have regard to any actual and potential effects on the environment prior to authorising the activity.

Actual or Potential Environmental Effects:
An assessment of the effects on the environment has been made above. The matters discussed and the conclusions reached are also applicable with regard to the adverse effects assessment under section 104(1)(a) of the Act, the following additional assessment is also considered relevant:

Effects on Aerodrome Operations
The Glint and Glare report produced by ITP concluded that no flight paths being utilised by the Foxton aerodrome will receive no glare at all times of the year. This will result in no safety concerns on pilots and aircraft utilising the aerodrome for landing and take-off. I concur with the conclusions reached in the Glint and Glare report, therefore, having less than minor effects on the operations of the aerodrome.

Positive Effects:
When assessing the effects of an activity, positive effects on the environment should be included. This was reinforced by the High Court in its decision in Elderslie Park v Timaru District Council [1995], stating that:

> *"To ignore real benefits that an activity for which resource consent is sought would bring necessarily produces an artificial and unbalanced picture of the real effect of the activity".*

The proposal will result in a large amount of renewable solar energy being provided to the District. This will be a step forward in the Government's goal to facilitate 90% of New Zealand's energy by way of sustainable, renewable energy by 2025. Due to the scale of the proposed earthworks and the construction of the solar panel farm, this will provide a number of jobs over this period, until construction is finished.

Conclusion:
Overall, I consider the actual or potential effects on the environment will be less than minor for the reasons outlined above.

6.2 – Section 104(1)(ab): Measures to ensure positive effects to offset or compensate for any adverse effects on the environment

The applicant has not proposed or agreed to any measures to ensure positive effects on the environment to offset or compensate for any adverse effects on the environment that will or may result from allowing the activity.

In this case, I consider that no measures are necessary as the actual or potential effects of the proposal have been assessed to be acceptable.

6.3 – Section 104(1)(b): Relevant Provisions

I have had regard to the following planning documents:

- National Environmental Standards
- National Policy Statements
- The New Zealand Coastal Policy Statement
- The Regional Policy Statement
- The District Plan

Higher Order Planning Documents

I have given regard to the higher order planning documents specified at section 104(1)(b)(i) to 104(1)(b)(vi) of the Act. It is my opinion that, other than the National Policy Statement for Renewable Electricity Generation (2011) discussed below, there are no National Environmental Standards or other National Policy Statements that are directly relevant to the consideration of this proposal. Similarly, the New Zealand Coastal Policy Statement is not relevant.

National Policy Statement for Renewable Electricity Generation (NPSREG) has a single objective which states:

> *Objective*
> *"To recognise the national significance of renewable energy generation activities by providing for the development, operation, maintenance and upgrading of new and existing renewable electricity generation activities. Such that the proportion of New Zealand's electricity generated from renewable energy sources increases to a level that meets or exceeds the New Zealand Government's national target for renewable electricity generation."*

Policy A – H2 are of importance to this application, most notably Policy A, B and C. The Regional Policy Statement has given full effect to the NPSREG.

The proposal is considered to accord with the general strategic direction of Horizon's Regional Policy Statement and therefore, the NPSREG. An assessment against the objectives and policies of the Horizons One Plan can be found within the applicant's AEE (p. 27-30). I consider this assessment to be accurate and I adopt this for the purpose of this report.

District Plan

I consider the applicant's assessment against the relevant objectives and policies (p.30-33) to be accurate. I therefore adopt the applicant's AEE and consider the proposal to be consistent with the objectives and policies of the District Plan. In addition to the assessment provided within the applicant's AEE, the following policies are also considered relevant to the application. These are the policies that a specific to the Foxton Dunefields landscape domain. An assessment against these additional polices can be found below:

Additional Policies	**Assessment**
POLICY FD.1 Manage the scale, intensity, size and design of subdivision and land development to ensure that it reflects and retains the distinctive dune landform pattern, natural habitats and landscape character and qualities of the Foxton Dunefields Domain.	The proposed land development and earthworks will see a number of smaller dunes across the centre of the application site being levelled to allow for a build platform for the solar farm. Across the centre of the application site there is also a moderately sized dune that will be levelled (see figure 6). These central dunes are currently have vegetation over them from the old forestry activity on the site. The alternation and levelling of these dunes in the middle of the application site will not impact the overall dune formation. The two large dunes located at the south of the application site and the large dune at the west of the application site will be completely retained. As the dune formation of the southern dunes and the western dune will be retained, I am of the opinion that the distinctive dune patterns will be reflected through the proposal, and the character of the landscape domain being retained and the proposal to be in keeping with this policy.
POLICY FD.5 Minimise obtrusive built elements in the dune country landscape by integrating building location and design with the surrounding landform and landscape qualities, including by avoiding buildings on dune ridgelines and elevated sites.	The proposal will not result in an obtrusive built element within the Foxton Dunefield Landscape Domain. The proposal will see solar arrays with a height of 2.29m across the application site, with a shed with a height of 3.6m also being proposed. The proposal will see the retention of the large dune along the south boundary and the western boundary of the application site, resulting in the proposed solar arrays and buildings will not be obtrusive

	and will not be proposed on any ridgeline being retained. The assessment of landscape and visual amenity effects report by Simon Cocker, made mention to the low lying buildings and solar arrays along with the proposed landscaping resulting in the rural landscape qualities being retained. I consider that the proposal is in keeping with this policy.
POLICY FD.6 Ensure that the natural habitats of the parabolic dunefields and inter-dunal areas, particularly remnant indigenous forest areas and wetland areas, are identified and protected from inappropriate subdivision and development.	The application site has no wetlands located on it. The application site historically was utilised as a forest block and has since been cleared of all vegetation. There are a number of overgrown vegetation present on the application site that has grown back since the forestry clearance. Mr Cocker described the application as being *"extensively modified over many decades and is primarily under dense exotic weeds including gorse, blackberry, and pampas. Some kanuka is evident".* I do not consider that there are any natural habitats or wetlands that need protecting and that the proposal is in keeping with this policy.
POLICY FD.7 Protect identified historic heritage and cultural values of the Foxton Dunefields Domain by avoiding the adverse effects of inappropriate subdivision and land development.	The application site does not have any identified heritage or cultural values within Council's database. Both Muaūpoko Tribal Authority (MTA) and Raukawa were contacted to provide comments on potential cultural effects relating to the application site. As discussed in the cultural effects assessment, further input from iwi has dfrevealed that there is significant cultural significance of the largest dunes (southern and western). Mr Wilson from MTA expressed that the top of the highest dune formations were often used when Maori used to travel from the ranges down to the coast, so have some significance in that regard. There was also the expression that there might be some human remains present as depending on someone's status, they might be buried on the western side of the larger dunes. Ms Rump, CEO of MTA expressed

	support for the proposal based on the amendments being made having discovery protocol in place and the western dune being retained. Because of this, iwi representatives should be present during the earthwork and an accidental discovery condition will be enforced in the event of an artefact or human remains being discovered. Based on a suitably worded condition, I am of the opinion that Policy FD.7 will be met.

As established in Section 5.1 and 5.2 of this report, the proposal is deemed to have less than minor effects. The application site, being already modified and the retention of the large dunes along the southern boundary and the western boundary means that the proposal can meet the landscape specific objectives and policies as specified above. Therefore, based on the assessments made above and throughout this report, and the recommended consent conditions outlined in Section 9 of this Report, the proposal is considered to be consistent with the Objectives and Policies of the District Plan and considered to be an appropriate activity on the application site and within the Foxton Dunefields Landscape Domain.

6.4 – Section 104(1)(c): Other Matters

In advising DOC of the location of the proposed earthworks, DOC raised concern with four main aspects to the proposal as their functions under Schedule 4 of the Conservation Act 1987 with these being:

- Herpetological values, and their future management, including any Wildlife Act requirements.
- Botanical values.
- Details on iwi consultation, and the outcome of these discussions.
- Context around the value of these dunes in the surrounding landscape, including their landscape and geomorphological importance.
- Archaeological values/ plan for discoveries.

The applicant has obtained Resource Consent from Horizons Regional Council (APP-2022203850.01). I have taken the comments within the powers of a Territorial Authority into consideration. Consultation with MTA was undertaken, who expressed support for the proposal and with an archaeological discovery condition being enforced. The landscape report by Mr Cocker and the independent peer review by Ms McRae have taken the landscape values into consideration. The herpetological, botanical and Wildlife Act were not considered within the

power of a Territorial Authority to consider, and have been addressed through the issuing of the Horizons Regional Council consent.

6.5 – Part 2 of the Resource Management Act

I am aware of the recent case in the Court of Appeal being "*R J Davidson Family Trust v Marlborough District Council [2018] NZCA 316*". My understanding of this case is it essentially applies the principles of the King Salmon case to consents. Therefore, a full Part 2 assessment need not be undertaken provided there is no known illegality, uncertainty, or incompleteness in the relevant part of the District Plan. As there are no known illegalities, uncertainties or incompleteness with the District Plan relating to this consent therefore no further assessment against Part 2 of the Resource Management Act, 1991 is considered necessary.

7. RECOMMENDATION

It is recommended that the application by The Catalyst Group, on behalf of Far North Solar Farms Ltd for the operation and construction of a solar panel farm and associated earthworks and dune modification at Bergin Road, Foxton legally described as being Lot 7 DP 68629 (WN37A/738), and Lot 3 and 4 DP 27011 (WN39A/818), **be granted** for a Discretionary Activity pursuant to sections 104 and 104B of the Resource Management Act 1991 for the following reasons:

1. It is considered that the activity will not have or be likely to have adverse effects on the environment that are more than minor beyond the subject land and adjacent land.
2. The effects are considered to be less than minor such that no persons have been identified as potentially affected.
3. That due regard has been given to the objectives and policies of the District Plan and it is consistent with those provisions.

8. DECISION

The Horowhenua District Council **grants** resource consent for the reasons stated in the recommendation above, to Far North Solar Farms Ltd under sections 104 and 104B of the Resource Management Act 1991 for the operation and construction of a solar panel farm and associated earthworks and dune modification at Lot 7 DP 68629 (WN37A/738), Lot 3 DP 27011 and Lot 4 DP 27011 (WN39A/818), be a non-notified application under sections 95A - 95E for a Discretionary Activity, subject to the conditions outlined in Section 9 below.

9. CONDITIONS

In accordance with s108 of the Resource Management Act, resource consent has been granted subject to the following conditions:

General

1. The consent holder must undertake the construction, operation and maintenance of the solar farm in general accordance with the application and information submitted and held on Council file 501/2022/18 including:
    a. ”Site Plan titled “Ganesis – Foxton – 39.5MWp New Zealand”; and
    b. The additional information received on 29th September 2022 specifying the western dune will be undisturbed and earthworks will not be carried out on or within the dune.

    Minor alterations may be approved upon request providing the development is not materially different, the scale and intensity of adverse effects will be no greater, and no approval from affected persons is needed.

    Where there may be inconsistencies between information provided by the applicant and conditions of the resource consent, the conditions of the resource consent will apply.

2. The consent holder shall contact the Council’s compliance monitoring officer at least 48 hours prior to any physical work commencing on the site and advise the officer of the date upon which such works will commence.

3. The consent holder shall ensure that a copy of this consent and all relevant management plans are to be held on the site to which the consent relates at all times. These should be readily available and shall be produced without unreasonable delay upon request from an agent of the Horowhenua District Council.

4. The consent holder shall ensure that all contractors or consultants engaged to undertake activities authorised under this resource consent are made aware of the conditions of consent that apply and are relevant to their work.

PRE-CONSTRUCTION

Landscaping

5. The consent holder shall prepare and submit a detailed Landscaping Mitigation Plan, produced by a suitably qualified individual for the entire subject site to the Chief Executive of Horowhenua District Council. As a minimum, the following information must be provided:
    a. a list of plant species to be included in the landscaping mitigation design plan;
    b. intended locations and density of planting;
    c. weed management protocols;
    d. on-going maintenance requirements.

6. The consent holder must not commence works until technical certification of the Landscaping Plan has been received.

7. The consent holder shall implement the landscaping mitigation planting as specified in condition 5 above and shall be planted within the first planting season following the issue of this consent.

    All planting is to be a minimum of 1.5 metres in height when planted. Photo evidence of this planting shall be provided to the Horowhenua District Council compliance monitoring officer within three months of planning being implemented.

8. The landscaping mitigation planting shall specified in condition 5 shall be maintained in a healthy state in perpetuity, with any dead or dying plants replaced within the next planting season.

Cultural

9. The consent holder shall provide evidence to the Horowhenua District Council Compliance Monitoring Officer that Iwi groups; Muaūpoko Tribal Authority, Raukawa and Rangitāne and Hapū have been given the opportunity to perform a karakia to bless the project site prior to earthworks being undertaken.

10. In the event of an archaeological site, waahi tapu or koiwi being discovered or disturbed during the activities authorised by this consent, the Consent Holder must immediately cease further work and inform:
    a. the local iwi and hapū; and
    b. Heritage NZ, National Office; and
    c. the Police; and
    d. the Horowhenua District Council's Consent Monitoring Team.

    Further work at the site must be suspended while iwi carry out their procedures for removal of taonga. The Council's Consent Monitoring Team will advise the Consent Holder when work at the site may recommence.

Advice Notes: *In the event that human remains are found the Police should be contacted immediately. All works must cease until advice is given that works can recommence. Iwi representatives from Muaūpoko Tribal Authority, Raukawa and Rangitāne must be contacted. Heritage NZ, National Office, can be contacted on (04) 472 4341.*

11. At least 5 workings days before earthworks are to commence, the consent holder shall provide Muaūpoko Tribal Authority, Raukawa and Rangitāne the opportunity to have a representative present during the earthworks under this consent.

12. The Consent Holder must, at least ten (10) working days prior to commencing activities authorised by this resource consent, provide the Muaūpoko Tribal Authority, Raukawa and Rangitāne (Tanenuiarangi Manawatū Incorporated) and local hapū with a finalised erosion and sediment control plan (ESCP).

Erosion and Sediment Controls

13. The Consent Holder must, at least ten (10) working days prior to commencing activities authorised by this resource consent, provide the Horowhenua District Council with a finalised erosion and sediment control plan (ESCP).

    Advice Note: *It is expected that the finalised ESCP has been certified in writing by the Manawatū–Whanganui Regional Council, in accordance with resource consent for large scale land disturbance sought under the One Plan.*

14. Prior to any earthworks commencing, the Consent Holder must submit a statement signed by an appropriately qualified and experienced professional certifying that all erosion and sediment control structures have been constructed in accordance with the certified ESCP required by Condition 12.

15. Land disturbed by earthworks, trenching or building activities shall be regularly wetted to ensure that dust nuisance is maintained within the site boundaries.

16.]f earth worked materials are carried onto the surrounding road network, the consent holder shall be responsible for cleaning and repairing the road back to its original condition each evening during the earthworks period. In doing this, the consent holder shall ensure that no materials are washed or swept into any stormwater drains or natural drainage systeMs

17. All areas exposed by earthworks, trenching or building activities not covered by hard surface shall be re-grassed/hydro-seeded at the earliest possible opportunity following excavation.

18. The Consent Holder must ensure that works authorised by this consent shall be undertaken in such a manner so as to avoid any flooding, erosion and instability of land on adjacent properties.

Construction Management Plan

19. Prior to any works being undertaken on the site, a Construction Management Plan (CMP) prepared by a suitably qualified and experienced professional shall be provided to the Chief Executive, Horowhenua District Council for certification. The CMP shall include but not limited to:
    a. Details of the works, construction timetable and hours of operation.
    b. Lighting during construction
    c. Anticipated truck movements to and from the site during construction
    d. Contact details for the contractor, including a process for complaints.

20. The consent holder shall carry out operations in general accordance with the provisions of the approved CMP specified in condition 19 outlined above. This includes any subsequent changes.

Decommissioning

21. At least 40 working days prior to the decommissioning of the solar farm authorised as part of this consent, the consent holder shall submit to Horowhenua District Council Compliance monitoring officer a Decommissioning Plan. This plan shall include, but not limited to:
    a. The details of the infrastructure that will be decommissioned, including the details of any specific infrastructure to remain on-site post-closure and why it is to remain;
    b. The schedule and timing of the decommissioning; and
    c. Details for the finished ground level and cover at the completion of decommissioning and any future intended land-use.

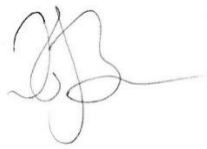
Review

22. The Horowhenua District Council, under s128 of the Resource Management Act, may once per year serve notice of its intention to review all conditions of this resource consent for the purpose of reviewing the effectiveness of these conditions in avoiding and mitigating any adverse effects on the environment. The review of conditions shall allow for:
    a. deletion or amendments to any conditions of this resource consent to ensure adverse effects are appropriately mitigated; and / or.
    b. addition of new conditions as necessary, to avoid, remedy or mitigate any unforeseen adverse effects on the environment; and / or.
    c. if necessary and appropriate, the adoption of the best practicable options to avoid, remedy or mitigate any adverse effects on the environment.

Report prepared by:

Vincent Ashman
Resource Management Planner

Consent reviewed by:



Daniel Batley
Senior Consultant Resource Management Planner

Issued under delegated authority by:

Luka Jansen
Planning Team Leader

Application lodged: 19th April 2022
Application approved: 12 October 2022

ADVICE NOTES

- The subject Lots lie within an area identified as having the potential for ponding. The design and construction of the site and associated equipment shall take into account the potential for ponding within the site associated with high rainfall events and or high water tables.

- In accordance with section 357 of the Resource Management Act 1991, the consent holder is able to object to the conditions of the consent. The consent holder must submit reasons in writing to Council within 15 working days of the date of this decision.

- Under Section 125 of the Resource Management Act 1991, your consent will lapse in five years from the decision date unless you begin your project (give effect to the consent) before then.

- The consent applies to the application as approved by Council. The consent holder should notify Council if there are changes to any part of the plans. Council may require that the consent holder submits a new resource consent application.

- The consent is not to be exercised until all charges fixed in accordance with section 36(1) of the Resource Management Act 1991 and any finalised, additional charges under section 36(3) have been paid in full.

- The consent holder is liable for costs associated with monitoring of this resource consent under section 35 of the Resource Management Act 1991.

- This is not a Building Consent. The Building Act 2004 contains provisions relating to the construction, alteration, and demolition of buildings. The Act requires building consents to be obtained where relevant, and for all such work to comply with the building code.

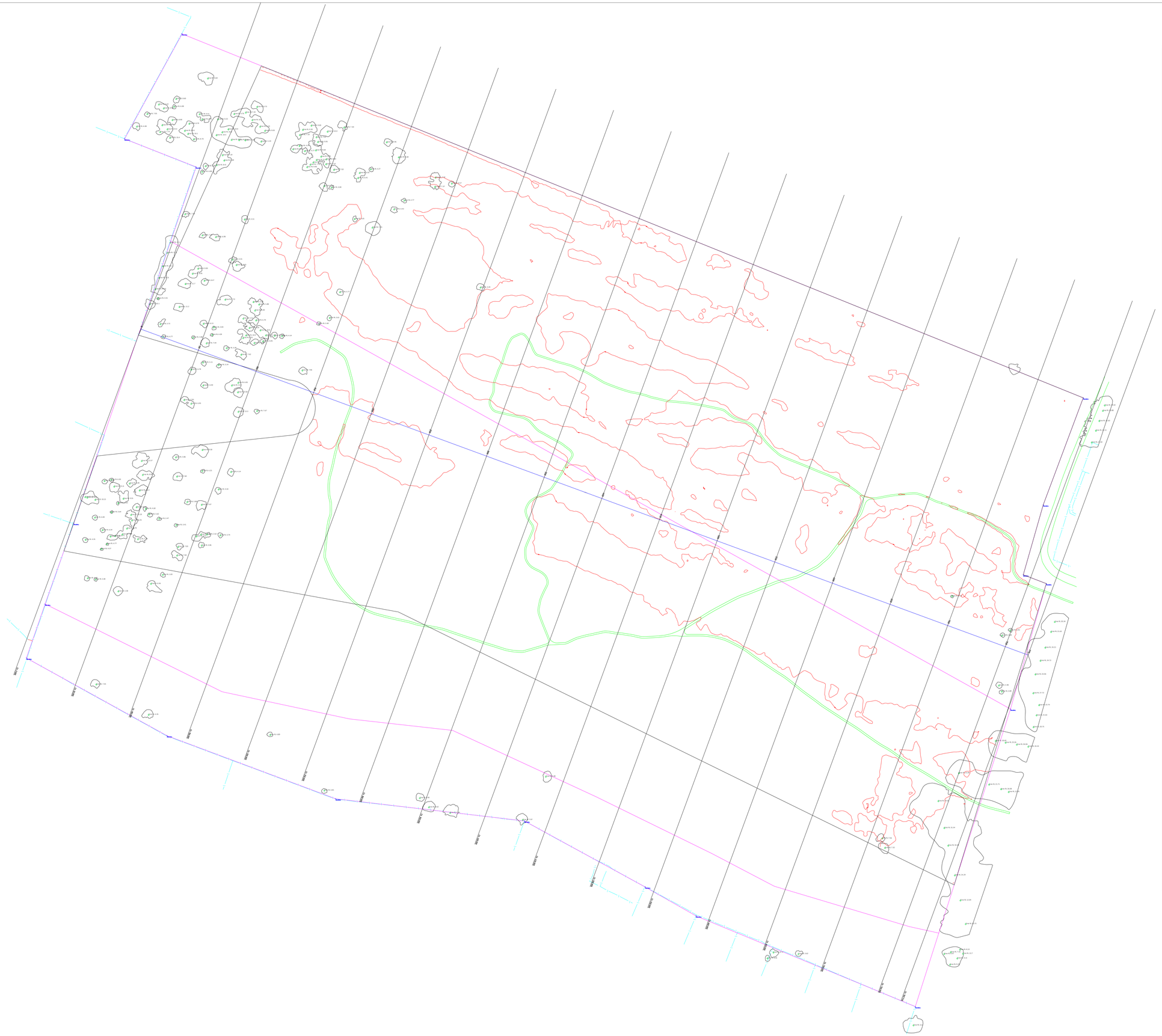
- For the avoidance of doubt: except where otherwise allowed by this resource consent, all land uses must comply with all remaining standards and terms of the Horowhenua District Plan. The consent holder will also have obligations with respect to the subdivision under the Building Act 2004 and the Manawatū-Whanganui Regional Council One Plan. All necessary consents and permits must be obtained prior to development.

- The consent is not a licence to create adverse effects such as unwarranted dust, noise or disruption. It does not change the legal duty to avoid, remedy or minimise such effects. Council may enforce the provisions of the Resource Management Act 1991 if the consent holder fails to meet this obligation.

- Failure to comply with an abatement notice may result in Council imposing an infringement fine or initiating prosecution.

- Prior to commencing any works within the legal road, the consent holder is responsible for applying for all new service connections via the appropriate process. Information on this process and applicable fees can be found at:

https://www.horowhenua.govt.nz/Services/HomeProperty/Water-Services/Service-Connections



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BOUNDARIES HAVE BEEN RECALCULATED FROM LT PLANS

THE TIN SURFACE HAS BEEN DERIVED FROM PHOTOGRAMMETRY AND LIDAR SURVEY. WHERE THERE IS NO GROUND INFORMATION DUE TO PHYSICAL OBSTRUCTION THE TIN MAY DIFFER FROM TRUE GROUND HEIGHT

THIS DRAWING IS IN METERS

Coords: 775201.350mN,
SURVEY ORIGIN 381096.450mE
RM XLIII SO 36090 (CVUX) : 5.397 Height

Coordinate System:
Wanganui Circuit 2000 (NZGD2000)

Vertical Datum: NZVD 2016

Surveyed by: BC/MC

Drawn by: AJ

Revision: 00

FAR NORTH SOLAR FARM LTD.

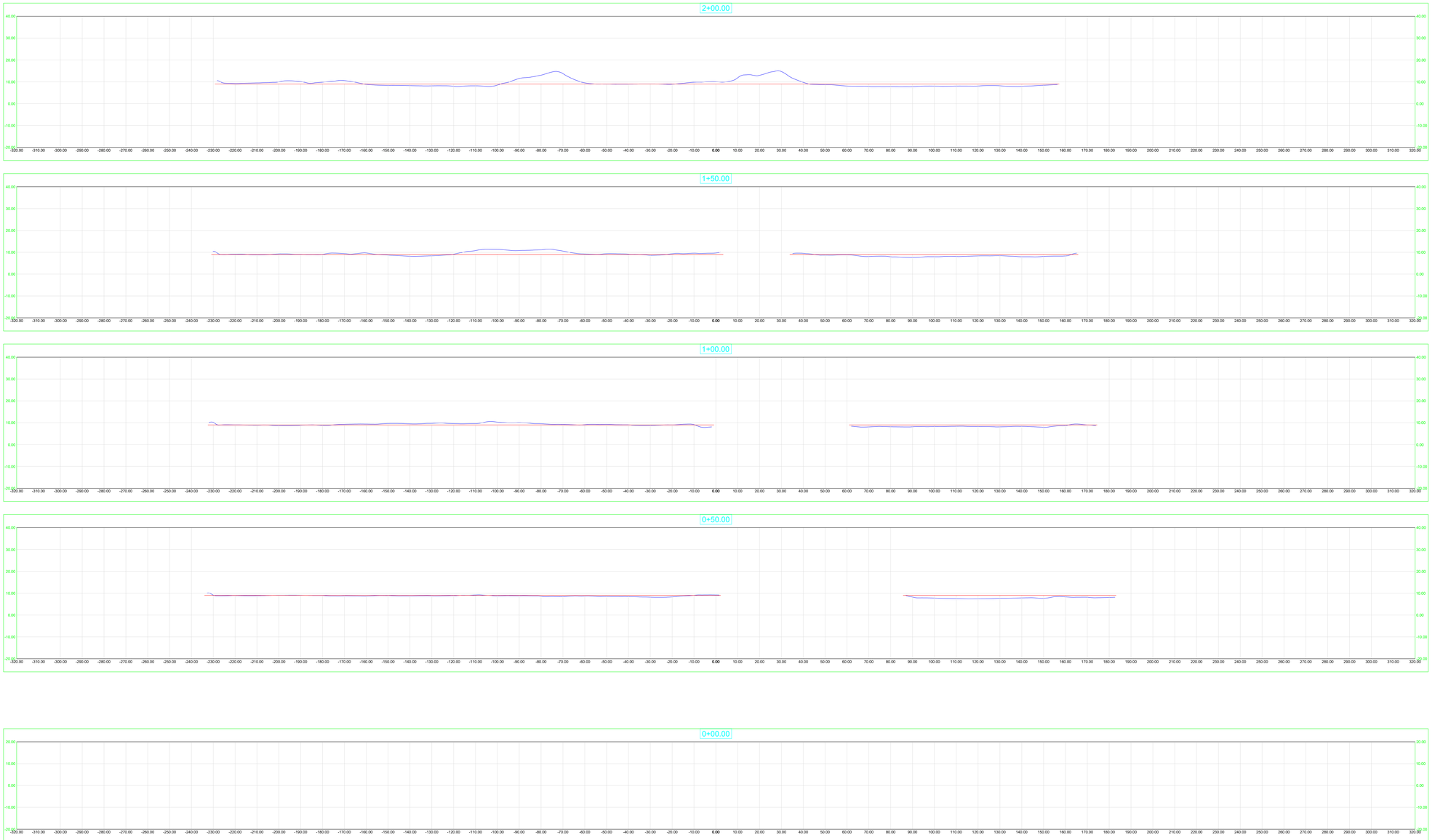
FOXTON PROPOSED FGL-09mtr & CONTOUR LAYOUT SOLAR FARM

Drawing No: 001

05/06/2022

Scale: 1:1500@A1

Sheet: 1 / 5



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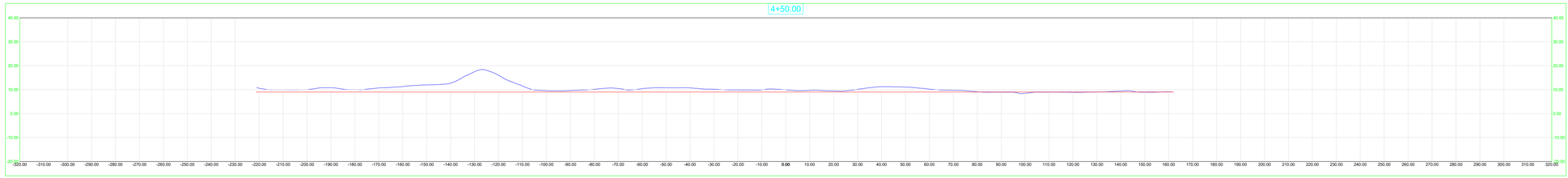

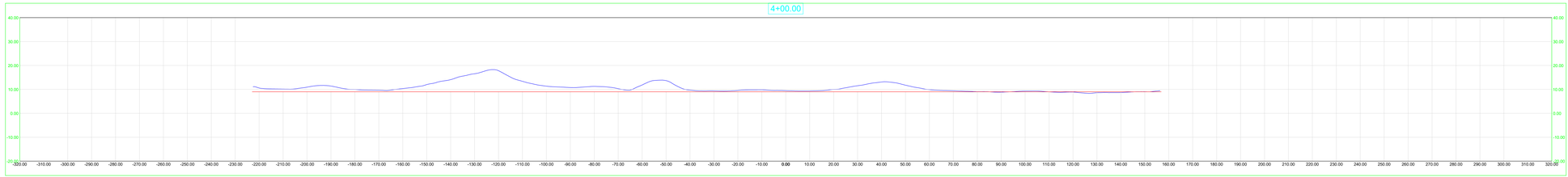

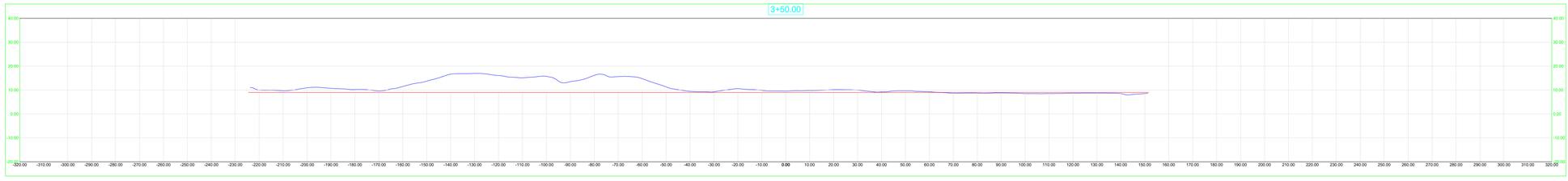

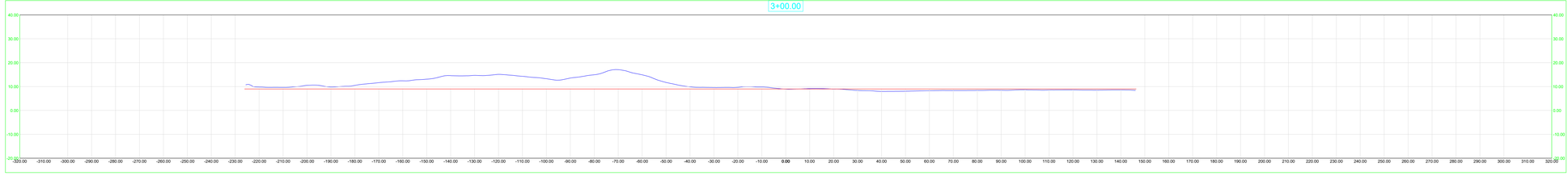

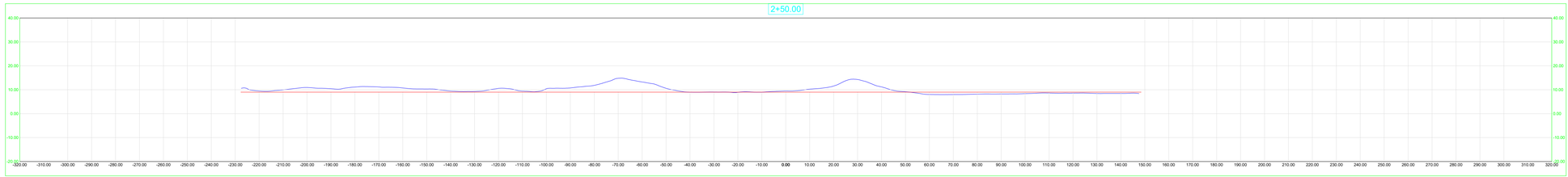

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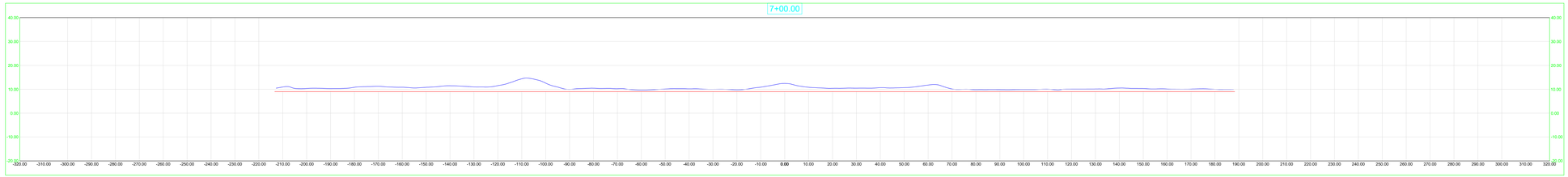

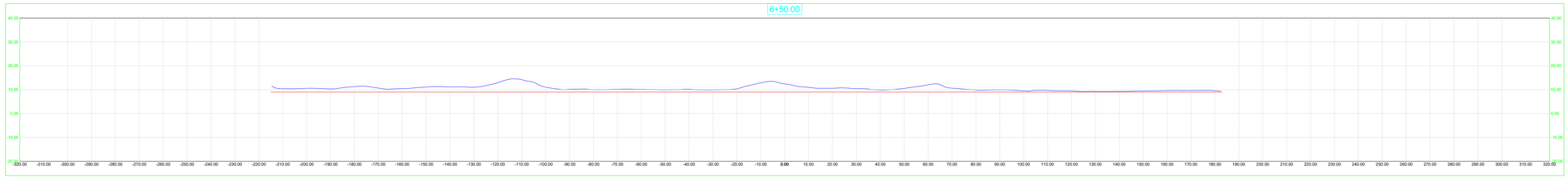

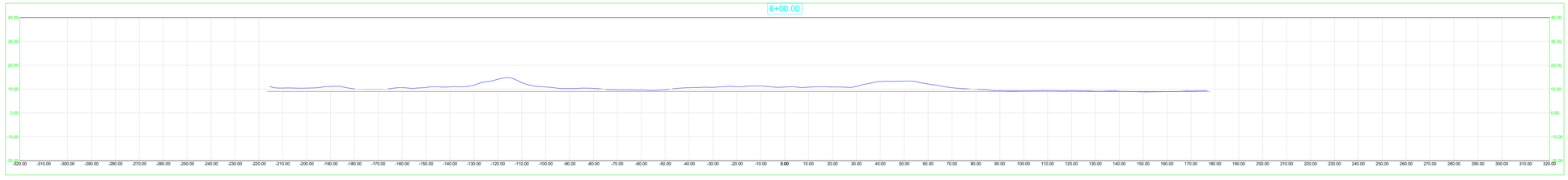

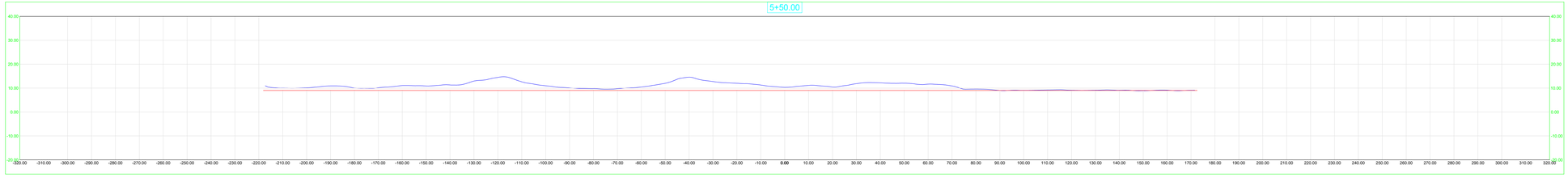

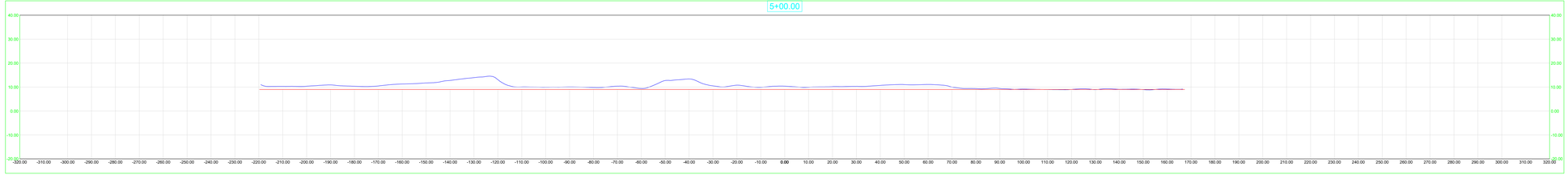

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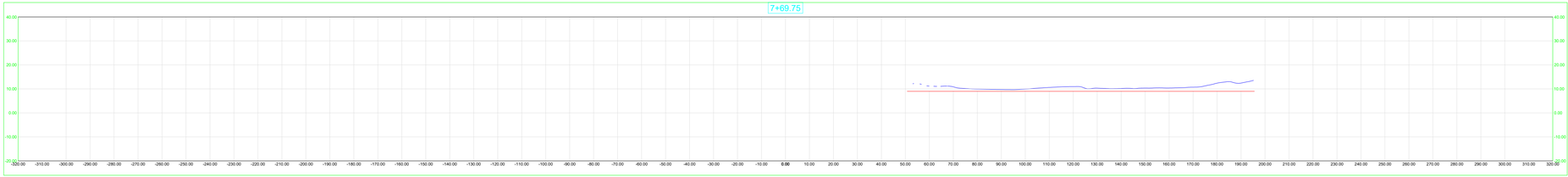

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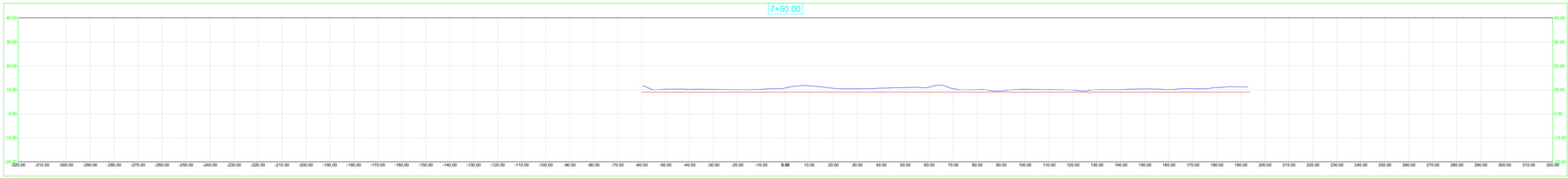

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Total Volume Table

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100.000	83.034	90.512	2254.039	6373.044	2432.225	10483.292	-8051.067
150.000	141.009	112.984	5601.085	5087.405	8033.310	15570.697	-7537.387
200.000	321.511	149.455	11563.016	6560.986	19596.326	22131.683	-2535.357
250.000	447.245	62.499	19218.898	5298.850	38815.224	27430.533	11384.691
300.000	725.861	73.277	29327.639	3394.411	68142.862	30824.944	37317.919
350.000	835.681	33.567	39038.547	2671.108	107181.409	33496.052	73685.357
400.000	684.078	11.129	37993.962	1117.395	145175.371	34613.448	110561.924
450.000	560.383	5.668	31111.512	419.921	176286.884	35033.368	141253.516
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Volume Summary

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Totals

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* Value adjusted by cut or fill factor other than 1.0

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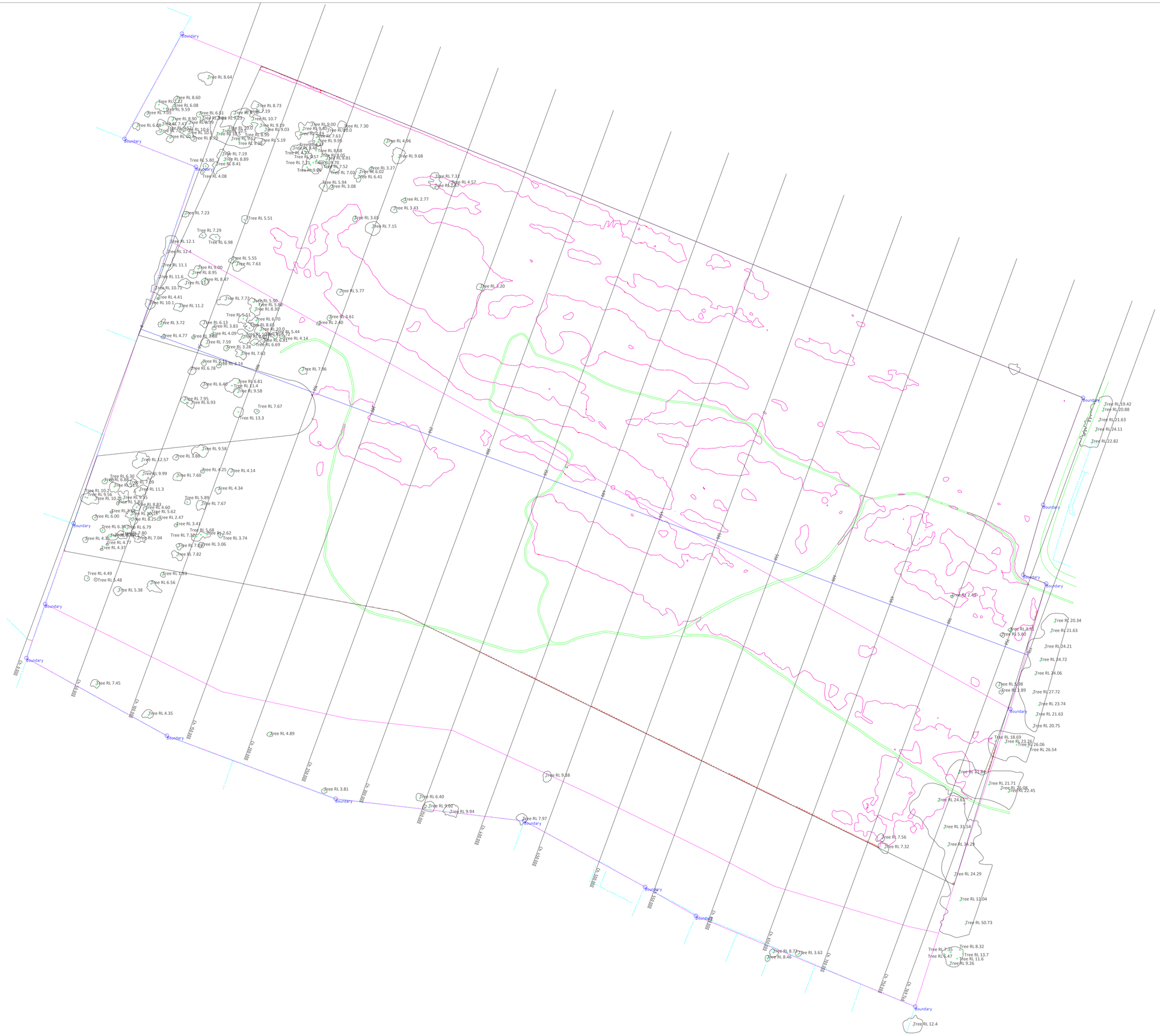

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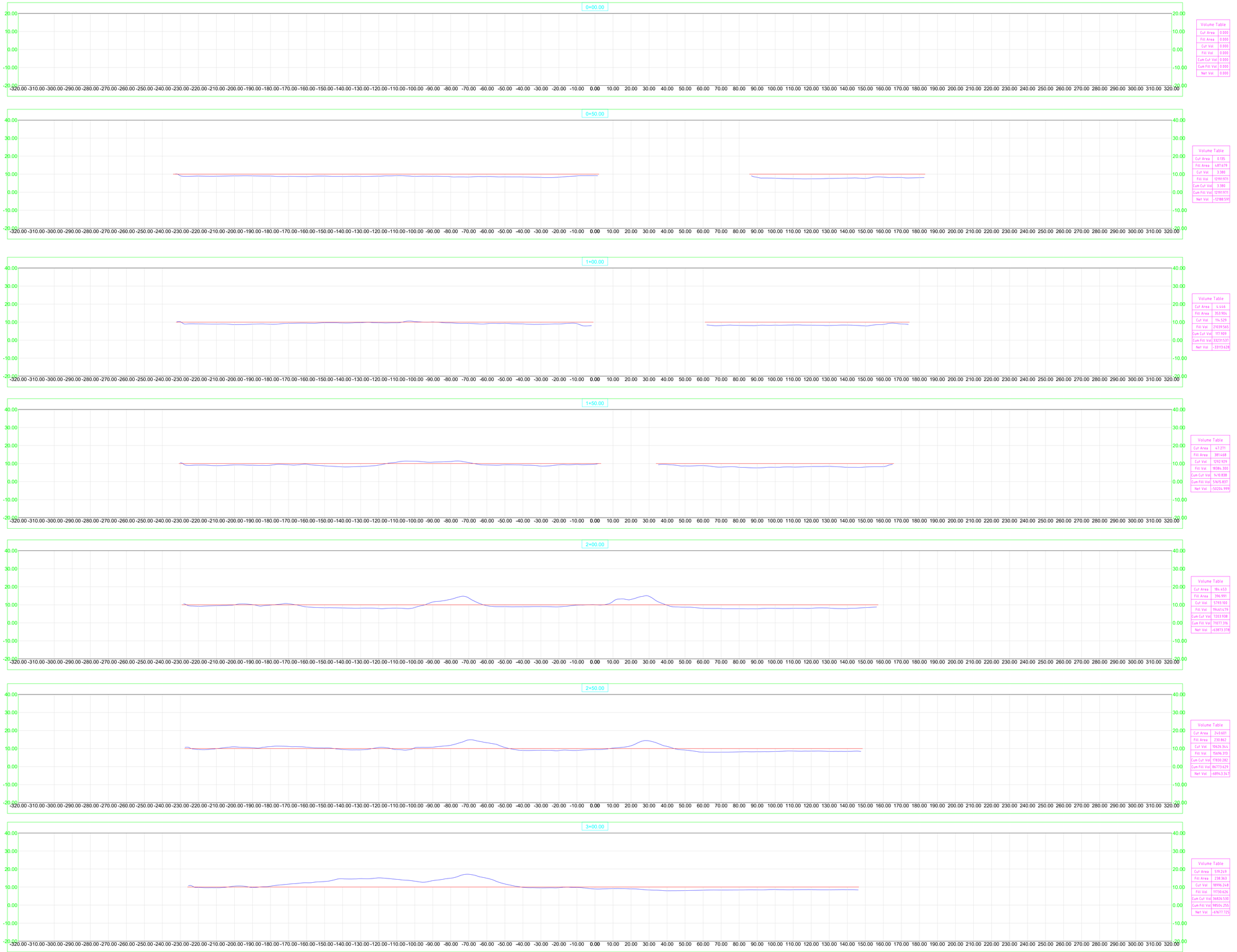

NOTES

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BOUNDARIES HAVE BEEN RECALCULATED FROM LT PLANS

THE TIN SURFACE HAS BEEN DERIVED FROM PHOTOGRAMMETRY AND LIDAR SURVEY. WHERE THERE IS NO GROUND INFORMATION DUE TO PHYSICAL OBSTRUCTION THE TIN MAY DIFFER FROM TRUE GROUND HEIGHT

LEGEND
FGL
NGL

Coords: 775201.350mN,
SURVEY ORIGIN 381096.450mE
RM XLIII SO 36090 (CVUX) : 5.397 Height

Coordinate System:
Wanganui Circuit 2000 (NZGD2000)

Vertical Datum: NZVD 2016

Surveyed by: BC/MC

Drawn by: AJ

Revision: 00

FAR NORTH SOLAR FARM LTD.

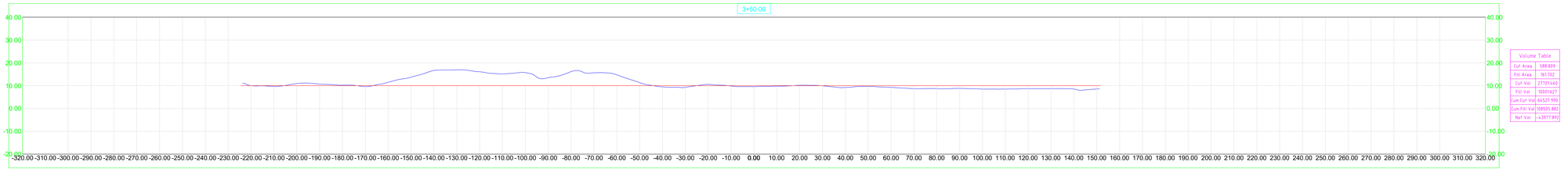
FOXTON PROPOSED FGL-10mtr & CONTOUR LAYOUT SOLAR FARM

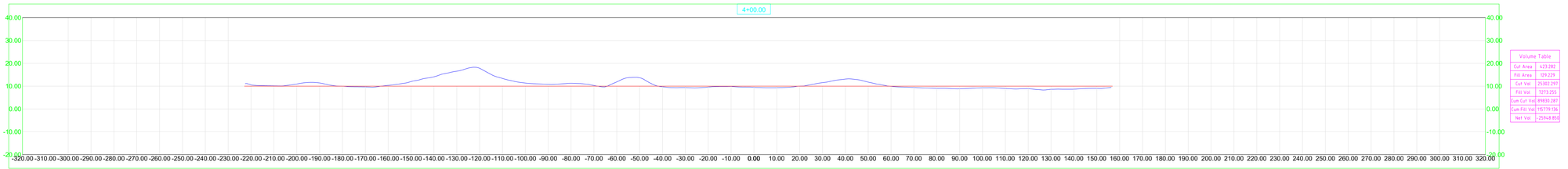
Drawing No: 001

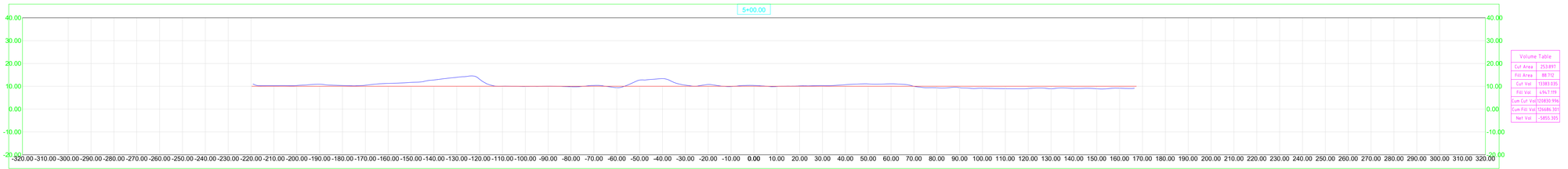
05/06/2022

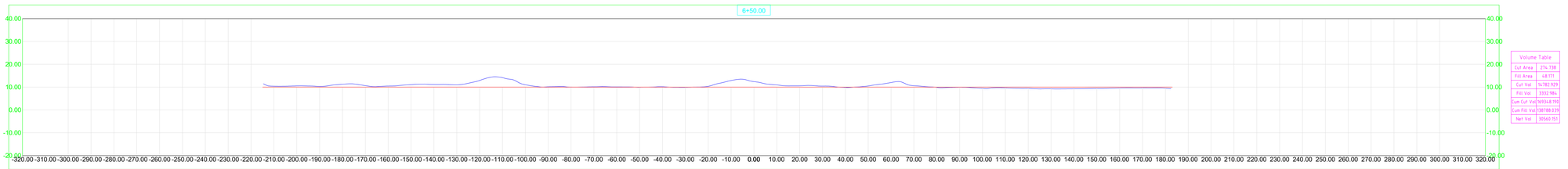
Scale: 1:1500@A1

Sheet: 2 / 4









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Drawing No: 001

05/06/2022

Scale: 1:1050@A1

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Total Volume Table

Station	Cut Area	Fill Area	Cut Vol	Fill Vol	Cum Cut Vol	Cum Fill Vol	Net Vol
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
50.000	0.135	487.679	3.380	12191.971	3.380	12191.971	-12188.591
100.000	4.446	353.904	114.529	21039.565	117.909	33231.537	-33113.628
150.000	47.271	381.468	1292.929	18384.300	1410.838	51615.837	-50204.999
200.000	184.453	396.991	5793.100	19461.479	7203.938	71077.316	-63873.378
250.000	240.601	230.862	10626.344	15696.313	17830.282	86773.629	-68943.347
300.000	519.249	238.363	18996.248	11730.626	36826.530	98504.255	-61677.725
350.000	588.809	161.702	27701.460	10001.627	64527.990	108505.882	-43977.892
400.000	423.282	129.229	25302.297	7273.255	89830.287	115779.136	-25948.850
450.000	281.425	109.173	17617.675	5960.045	107447.961	121739.181	-14291.220
500.000	253.897	88.712	13383.035	4947.119	120830.996	126686.301	-5855.305
550.000	389.447	88.445	16083.604	4428.914	136914.600	131115.214	5799.386
600.000	316.579	85.149	17650.661	4339.841	154565.261	135455.055	19110.206
650.000	274.738	48.171	14782.929	3332.984	169348.190	138788.039	30560.151
700.000	259.202	11.993	13348.507	1504.086	182696.697	140292.125	42404.572
750.000	119.038	6.577	9456.012	464.254	192152.709	140756.379	51396.331
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Cut/Fill Report

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Drawing: 20220427 FOXTON WANGANUI 2000 VD16 FGL 10.0 mtr

Volume Summary

Name	Type	Cut Factor	Fill Factor	2d Area (sq.m)	Cut (Cu. M.)	Fill (Cu. M.)	Net (Cu. M.)
Volume	full	1.000	1.000	284400.621	207424.700	152024.496	55400.204<Cut>

Totals

	2d Area (sq.m)	Cut (Cu. M.)	Fill (Cu. M.)	Net (Cu. M.)
Total	284400.621	207424.700	152024.496	55400.204<Cut>

* Value adjusted by cut or fill factor other than 1.0

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05/06/2022

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Sheet: 4 / 4

THECATALYSTGROUP
planning and environment

INSTALLATION AND OPERATION OF A SOLAR FARM AT FOXTON

ASSESSMENT OF ENVIRONMENTAL EFFECTS

29 JULY 2022

USE OF THIS REPORT

This report has been prepared by The Catalyst Group at the request of our client for the purposes for which they intended. Where we have relied on information from external sources, we have referenced these sources as appropriate and assumed them to be accurate. If you are unsure about interpretation of the content of this report, or its use beyond that for which the client intended, please get in touch with us at enquiries@thecatalystgroup.co.nz

Please reference this report as:

[Burns,E], [Carlyon G] [2022] [Installation and Operation of a Solar Farm at Foxton]. The Catalyst Group Contract Report No. [2022/174] prepared for [Far North Solar Farm Ltd].

PREPARED BY:
Emily Burns

.....

REVIEWED BY:
Greg Carlyon

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CONTRACT REPORT NO:
2022/174

.....

PREPARED FOR:
Far North Solar Farm Ltd

.....

ACKNOWLEDGEMENTS:
XXXXX

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THECATALYSTGROUP
planning and environment

Version 0.4
Final Version

Document control:			
Date	**Version**	**Description**	**Authorised by:**
12 April 2022	0.1	Working draft yet to include the Assessment of Landscape Effects and Potentially Affected Parties.	Greg Carlyon
1 May 2022	0.2	Working draft yet to include the Assessment of Landscape Effects and Potential Affected Parties, with updated site layout and photo of the array.	Greg Carlyon
17 June 2022	0.3	Working draft submitted to Horizons Regional Council for review with respect to earthworks. Additional Potential Affected Parties to be added to supplementary information.	Greg Carlyon
29 July 2022	0.4	Final Version	Greg Carlyon

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1 INTRODUCTION

The proposed development to be undertaken by Far North Solar Farms (FNSF) consists of a photovoltaic solar farm next to Foxpine Airpark, Bergin Road, Foxton, 4814. The site has access to a substation at Union Street, which is 2.7km away in terms of cabling routes. The land is large enough to accommodate the farm and is situated in an industrialised area of the rural zone. It provides all the necessary attributes to be viable for solar generation.

Resource consent is required for use of the land and other activities that are to take place on site during construction.

Construction on the site is to begin in Q4, 2022 and the expected duration of construction will be 9 months.

1.1 APPLICANT DETAILS

Applicant: Far North Solar Farm Ltd [redacted]

Site: Bergin Road, Foxton

1.2 PURPOSE OF REPORT

This report has been prepared in accordance with Section 88 and the 4th Schedule of the Resource Management Act 1991 (RMA), including the preparation of an Assessment of Environmental Effects (AEE). The report is additional supporting information to Council's prescribed application form.

1.3 RELEVANT PLANNING DOCUMENTS

The following statutory documents contain regulatory rules and standards which the FNSF Project will need to be reviewed against:

- The One Plan as amended in 2018 – Horizons Regional Council
- Horowhenua District Plan (2015)
- Resource Management (National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS).
- The Resource Management Act 1991
- National Policy Statement for Renewable Energy Generation 2011 (NPSREG 2011);
- National Policy Statement for Freshwater Management 2020 (NPSFM 2020);

2 DESCRIPTION OF THE PROPOSAL

2.1 SITE DESCRIPTION

The site lies on the outskirts of Foxton in a rural setting approximately 4.2km from Foxton Beach (see Figure 1). The site covers 35.4 Hectares, with 32.22 Hectares to be covered by the solar array. To the immediate North of the site is Foxpine Airpark along with industrial sites to the East and a residential setting to the Southeast. On the Northeast and Southern perimeters, the environment consists of agricultural land which is used for mainly arable purposes. A parabolic dune runs parallel to the Southern Boundary within the perimeter of the site. The site is accessed via a road leading West from Bergin Road.

Figure 1: Site of the proposed solar farm shown in the red polygon.

2.1.1 Land Use

The site proposed for the Foxton Solar Farm is a remnant dune series which has been extensively modified over many decades. It is an unused site with vegetative cover predominantly made up of weed species, waste ground cover from the development of the adjacent airpark has been stockpiled on site. The site is periodically used by the community for access to the adjacent Foxton loop. There is currently no developed infrastructure of any type on site. The site is located within an environment with industrial and rural land use adjacent to the boundaries and residential land

use within proximity. The site is located adjacent to a private right of way that serves the Foxton Airpark.

2.1.2 Property Details

Information on property details for the site as well as lot divisions can be seen in Table 1.

Table 1: Property details for solar farm, Foxton.

Record of Title	Legal Description	Area (hectares)	Owner	Address
WN39A/818	Lot 3-4 Deposited Plan 27011	23.7095 ha more or less	Levin Logging Co Limited	Colbert Cooper Ltd, 275 Oxford Street, Levin, 5510
WN37A/738	Lot 7 Deposited Plan 68629	16.1800 ha more or less	Levin Logging Co Limited	Colbert Cooper Ltd, 275 Oxford Street, Levin, 5510

The site is technically owned by Levin Logging Co Ltd. There is no current resource or planning consents for the property. There are two easements for the property specifically for Lot 3-4 and Lot 7 as the property is constituted. These agreements exist between The Natural Gas Cooperation of New Zealand and Levin Logging Co Ltd for a gas pipeline running through the property. There are no other rights over the property.

2.1.2.1 Title Instruments

Title instruments are evident on all Records of Title; however, none will be affected by the proposal so have not been specifically mentioned here.

2.1.3 Access

A private access track leads off Bergin Road and finishes at Foxpine Airpark. Access to the site will be via the privately owned road leading to Foxpine Park. An access road will be constructed near to the connection point on site for the purpose of maintenance. There is an access easement over land at Foxpine Airpark, which is currently used as an airfield. An electrical easement will be sought for this land as well in order to access the site from the last power pole. New peripheral roads will also be constructed within the site for operation and maintenance purposes.

2.1.4 Zoning and Overlays

The site falls in the rural zone and is directly adjacent to an industrial zone. A residential zone falls to the Southeast approximately 20 metres in distance from the site. There are no overlays on the site or significant heritage features. There is a moa hunter midden to the East of the site. The rural zone supports a number of primary production processes and is subject to varying land uses. As well as primary production, there is the requirement for these areas to provides for industries and utilities.

The area of the proposal falls within the coastal landscape of the Horowhenua District, being segregated from the rural plains setting by the Manawatu River which encloses the town of Foxton and Foxton Beach.

Below the site is the Foxton Loop formerly an oxbow in the Manawatu River. The flood hazard area for this loop extends to just below Foxton Beach Road.

2.2 GENERAL LAYOUT OVERVIEW

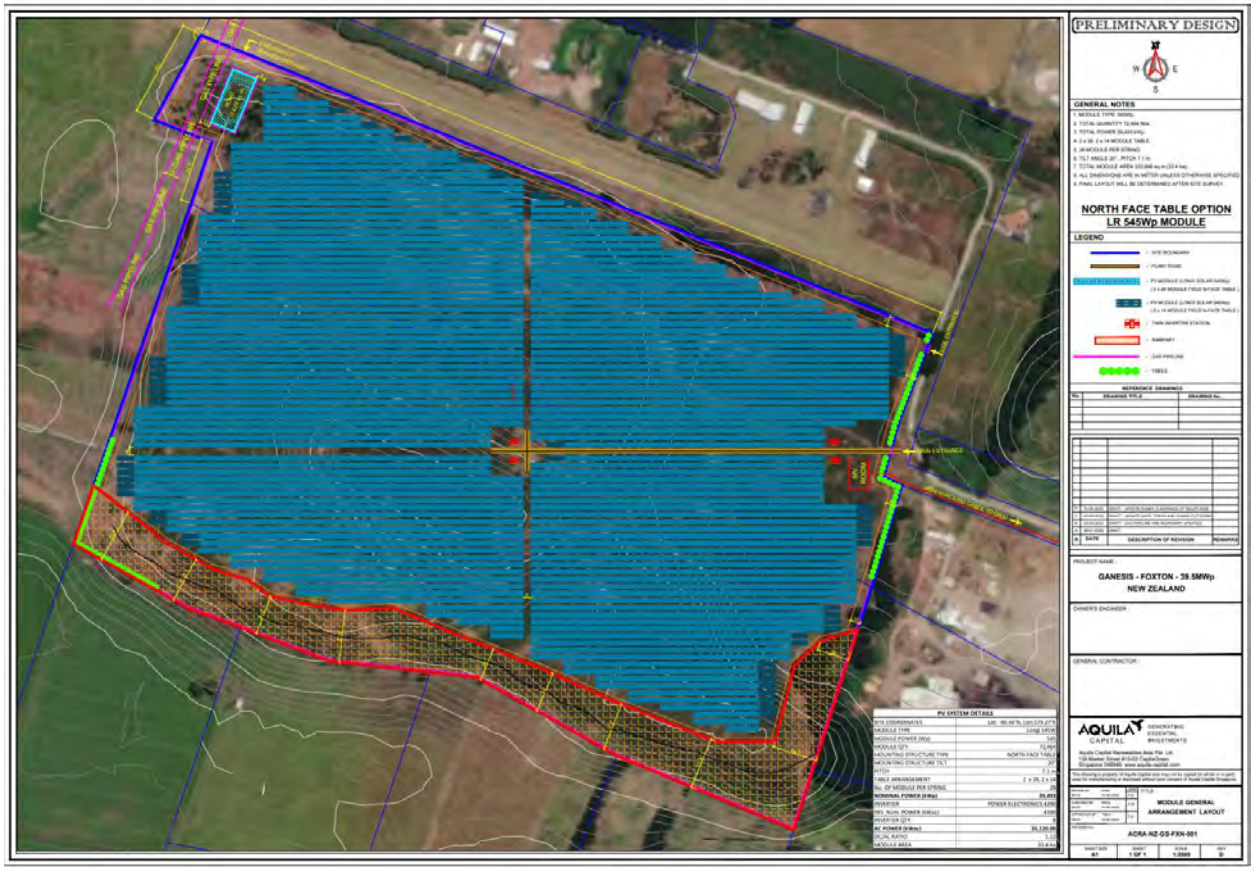

Figure 2: Drawing of Site Layout (Source: FNSF)

A conceptual drawing of the site overview can be seen in Figure 2. The site covers an area of 35.4 Hectares, with 32.22 Hectares to be covered by the solar PV modules and the rest to be covered by electrical equipment and stations, roadworks, a storage shed and cables. The storage shed will

be primarily used for the metering and SCADA system as well as HV equipment. In total for the site, 444 arrays will be placed along with 6 or 7 Inverter Stations (MVPS) and 52,000 solar panels. Each inverter station will consist of 372 arrays of 128 panels and 72 arrays of 64 panels for a total of 102 combiner boxes.

The panels will be fixed tilt at 20 degrees facing North. Into each solar mounting structure two modules of 600Wp are vertically mounted with 64 and 32 modules per string tables. The gap between two tables will be 6.7m.

The total generation capacity of the of each inverter block will be 26.4 or 30.8 MW. An individual inverter block is rated at 4.4 MVA. The total solar capacity for the farm therefore equates to 31.334MWp using a 600-Watt panel. The site will also consist of an office, connection point and storage area to the East of the farm.

2.2.1 Landscape

The area is characteristic of undeveloped rural land. It consists of shrub and grassland dominated by weed species surrounded by pastoral farming land. There are access tracks running East to West through the site. To the North of the site is Foxpine Airpark, while the area adjacent to the site on the East side is used for timber storage and automotive dismantling. The site is not an Outstanding Natural Landscape nor is it an Outstanding Natural Feature. There are no landscape features of significance in the vicinity of or on the site.

2.3 SITE PREPARATION

There has been no earthworks or physical modification of the site undertaken by the applicant prior to consents being lodged. Vegetation clearance and earthworks will be required to provide a contour suitable for installation of the solar arrays. As identified in the AEE, the applicant intends to leave a margin on the Southern boundary by maintaining the bulk of the existing dune profile. The works required will result in soil disturbance across the bulk of the site and accordingly will require an earthworks and sediment control plan to avoid sediment losses from the site during the construction phase and manage windblow and dust.

The timing of the development is orientated around disturbance and stabilisation of the site (with grass cover) through the Spring period with infrastructure installation through the Summer period 2022/23. This activity will have no more than minor effects beyond the boundary with respect to impacts on the whenua.

2.4 INFRASTRUCTURE ESTABLISHMENT

The mounting legs will be secured to concrete foundations placed over the topsoil. The legs for the mounts will be secured to the foundations. The panels will be supported on these legs and fixed at 20-degree tilt North.

Depiction of the Panel Arrangement

Figure 3: North facing mounting solar system (Source: Paul Hennessy/SOPA images/getty images)

2.5 OPERATIONAL ACTIVITIES

There is minimal input required in terms of activity once the installation is operational. The activity will be self-sustaining apart from intermittent maintenance requirements.

The electrical components are small and quiet, requiring internal cooling fans. These will be situated away from the boundaries of the development to insure minimal noise pollution offsite. They will be fixed tilt and therefore they will not be moving.

2.6 CONSIDERATION OF ALTERNATIVES

Schedule 4 of the RMA requires that consideration of alternatives is given where it is likely that the activity will result in any significant adverse effect on the environment.

Far North Solar Farms has secured a number of sites for development through. The location determination is driven by key factors including sunshine hours, constructive joint venture arrangements with landowners and proximity to electricity reticulation infrastructure. Critical to the solar farms commitments to communities it is establishing in, is development of infrastructure with effects that are no more than minor on any assessment. Accordingly, the location of the Foxton Solar Farm has met these criteria with a joint venture with a community landowner, use of a currently degraded site, a respectful development in relation to adjacent landowners (rural, industrial, and residential) and location that will allow energy supply directly to the adjacent transmission network. On this basis alternatives have not been considered beyond the early site identification phase.

3 RESOURCE CONSENT REQUIREMENTS

An assessment of the relevant planning documents and associated rules can be viewed in Table 2.

Table 2: Planning Assessment for the Proposal.

Rule and Relevant Document	Likely Overall Classification	Deciding Authorities	Comment
8(3) Disturbing Soils (NES 2011)	Not Applicable		Land has not had a Hazardous Activity of Industry List (HAIL) undertaken or currently being undertaken. No HAIL activity is known to exist.
National Environmental Standards for Freshwater 2020	Not Applicable		The proposal is not in the immediate vicinity of a watercourse, wetland, or lake. No resource consents for this proposal are triggered under these standards.
Horizons Regional Plan	Controlled?	Manawatu/ Horowhenua Regional Council	The earthworks will be undertaken with an Erosion and Sediment Control Plan in place. The site is not within 5 metres of a waterbody or within 10 metres of a wetlands, trout spawning areas or aquatic sites of significance.
19.4.1 Any activity that is not a permitted, controlled, restricted discretionary, or non-complying activity is a discretionary activity. (HDP)	Discretionary	Horowhenua District Council	Renewable energy developments of this level of generation are not listed as permitted, controlled, or restricted discretionary.

Rule and Relevant Document	Likely Overall Classification	Deciding Authorities	Comment
19.4.6 Lines and support structures (including towers, masts, and poles) for conveying electricity at a voltage exceeding 110kV.	Discretionary	Horowhenua District Council	The installation will supply a total voltage of 31.334MW.
19.6.3 (b) No part of any other building shall exceed a height of 15 metres. (HDP)	Permitted	Horowhenua District Council	The storage building will be the only building on site, and this will not exceed 15 metres in height.
19.6.5 (a) All buildings shall comply with the following setbacks: (i) 10 metres from any District road boundary; (ii) 15 metres from any State Highway boundary; (iii) 10 metres from any other site boundary; (iv) 15 metres from any bank or stream edge; (v) 20 metres from the bed of any water body listed in Schedule 12 – Priority Water Bodies.	Permitted	Horowhenua District Council	The proposal meets these restrictions on setbacks. It is approximately 400 metres from the boundary of Bergin Road. The site is accessed via a private road. The site boundary is over 1km away from the State Highway 1. It is approximately 380m from the Foxton Loop Stream and over 3km away for the Manawatu River.
19.6.8 (a) Noise Levels – Noise from any activity shall not exceed given limits when measured at, or within, any point within any other site.	Permitted	Horowhenua District Council	Noise limits during operation for the site will adhere to limits best out in the rules for noise in the rural zone under the District Plan.

Rule and Relevant Document	Likely Overall Classification	Deciding Authorities	Comment
19.6.8 (b) Environmental noise.	Permitted	Horowhenua District Council	Operational noise will comply with the relevant daytime and night-time standards
19.6.8 (c) Noise during construction and maintenance.	Permitted	Horowhenua District Council	The proposal will adhere to the provisions for constructional noise laid out in NZS 6803:1999 Acoustics – Construction noise.
19.6.9 Vibration	Permitted	Horowhenua District Council	Vibration will be below permitted levels.
19.6.10 Odour	Permitted	Horowhenua District Council	This activity will not give rise to offensive or objectionable odours.
19.6.14 Sites of Significance to Tangata Whenua (a) No activity or development shall modify, demolish, or remove any site of significance to Māori where such site has been identified to Council and recorded by the Council in a register of sites prior to the time that any activity or development is proposed.	Permitted	Horowhenua District Council	There are no sites of significance to Tangata Whenua on land for the proposed development.

Rule and Relevant Document	Likely Overall Classification	Deciding Authorities	Comment
19.6.19 Surface water Disposal (a) All activities shall make provision for the management of stormwater as means of dealing with water quantity and water quality to avoid significant adverse effects or nuisance.	Permitted	Horowhenua District Council	Disposal of stormwater to be included in plan along with management plan for sediment and erosion.
19.6.21 Vehicle Access	Permitted	Horowhenua District Council	Access is provided via Bergin Road. A new access track will be constructed directly onto the site near the connection point. There will also be peripheral roads constructed on site.
19.6.22 Vehicle Parking, Manoeuvring, and Loading	Permitted	Horowhenua District Council	A parking and manoeuvring area is provided on site.
19.6.23 Safety and Visibility at Road and Rail Intersection	Permitted	Horowhenua District Council	The proposed development will not obscure the railway level crossing approach site triangles.
19.6.27 Notable Trees	Permitted	Horowhenua District Council	No notable trees in vicinity listed in schedule 3 of the HDP.

Table 3: Planning assessment for Earthworks on Site

Rule and Relevant Document	Likely Overall Classification	Deciding Authorities	Comment
19.6.13 Earthworks-Specific Landscape Domains (a) Earthworks, other than cut for a building platform, on land that is not an Outstanding Natural Landscape and Feature, shall not exceed the following: (iii) Foxton Dunefields Landscape Domain • 3 metres (cut or fill) measured vertically • Where earthworks exceed 3 metres (cut or fill) measured vertically, those earthworks shall not exceed 5 metres (cut or fill) measured vertically and shall not exceed a distance of 50 metres in continuous horizontal length. • Where earthworks are to be undertaken on a dune, the vertical height of the dune, or any part of that dune, prior to the earthworks shall be no greater at any point than 10 metres from toe to summit. (Horowhenua District Plan)	Discretionary	Horowhenua District Council	Within the rural zone, the site falls with the Foxton Dunefields domain as shown in planning map 38. In this instance, Rule 19.6.13(a)(iii) is triggered. Within the rural zone, the site falls with the Foxton Dunefields domain as shown in planning map 38. In this instance, Rule 19.6.13(a)(iii) is triggered. Earthworks on the Western dune as marked in the topography survey, will exceed 3 metres cut. The entire dune will be levelled. The height of this dune is shown as approximately 20 metres. The dune on the Southern boundary of the site is to be undisturbed.
13-2 Large-scale land disturbance*, including earthworks – Except as regulated by Rules 13-6, 13-8 and 13-9, any land disturbance* pursuant to s9(2) RMA of a total area greater than 2500 m2 per property* per 12-month period and any ancillary: (a) diversion of water^ pursuant to s14(2) RMA on the land^ where the land disturbance* is undertaken, or (b)	Controlled	Horizons Regional Council	The earthworks will be of short duration in order to prepare the land for the array. The site is of varying topography, however the vegetation onsite is comprised of mainly weeds. The site is fairly undulating and significant earthworks will be required to flatten the site. The site is

discharge^ of sediment into water^ pursuant to s15(1) RMA resulting from the land disturbance*. (Horizons Regional Plan) a) The activity must not take place on land^ that is within a coastal foredune*. (b) The activity must be undertaken in accordance with an Erosion and Sediment Control Plan*. (c) Any ancillary discharge^ of sediment into water^ must not, after reasonable mixing, cause the receiving water body^ to breach the water quality standards for visual clarity set out in Schedule E for that water body^. (d) The activity must not occur on land^ that is in, or within 5 m of: (i) the bed^ of a river^ that is permanently flowing, (ii) the bed^ of a river^ that is not permanently flowing and has an active bed* width greater than 1 m, (iii) the bed^ of a lake^. (e) The activity must not occur on land^ that is in, or within 10 m of: (i) A wetland^ as identified in Schedule F, (ii) Sites valued for Trout Spawning as identified in Schedule B, (iii) Sites of Significance - Aquatic as identified in Schedule B.			surrounded by industry and agricultural land use. The applicant will follow a sediment and erosion plan to be addressed in the draft conditions for consent. The site does not fall within 5 metres of a riverbed or lake bed. The activity will not occur within 10 metres of wetland, trout spawning site or site of aquatic significance.

3.1 OTHER APPROVALS

The Horowhenua District Plan has regard to Section 7 of the RMA which specifies the Councils must have particular regard to energy efficiency, climate, and the benefits of renewable energy. Under the NPS for renewable energy generation, the development of renewable energy facilities must be provided for as a matter of national significance. This proposal aligns with Policies 12.2.1, 12.2.4,12.2.5, 12.2.6, 12.2.7, 12.2.8, 12.2.9, 12.2.10 under Objective 12.2.1 of The District Plan for Energy.

3.2 NOTIFICATION ASSESSMENT

In the applicant's view notification of the application is not required on the basis that the applicant does not seek it and the assessment by consent authority has not occurred at this time (no determination available on notification). In addition, there are no circumstances that would require the application to be publicly notified and critically the effects assessment provided within the application identifies that the effects of the application will be no more than minor.

On this basis a determination not to publicly notify the application can be made.

3.3 AFFECTED PERSONS ASSESSMENT

Schedule 4 of the RMA requires that an assessment of environmental effects identifies persons affected by an activity, any consultation undertaken, and any response to the views of any person consulted. While there is no requirement for an applicant to consult it is good practice and the principals of the project have engaged with the stakeholders who may be affected or interested in the project. A summary of this will be provided.

For the purposes of determining who is adversely affected by a change of consent conditions, the Council must consider, in particular, every person who—

(a) made a submission on the original application; and

(b) may be affected by the change or cancellation.

Section 95E of the RMA therefore applies in determining whether a person is affected in a minor or more than minor, but not less than minor, manner.

In assessing an activity's adverse effects on a person, the Council shall apply the following methodology;

a) may disregard an adverse effect of the activity on the person if a rule or a national environmental standard permits an activity with that effect; and

b) must, if the activity is a controlled activity or a restricted discretionary activity, disregard an adverse effect of the activity on the person if the effect does not relate to a matter for which a rule or a national environmental standard reserves control or restricts discretion; and

c) must have regard to every relevant statutory acknowledgement made in accordance with an Act specified in Schedule 11.

There are a number of standards that are not met by the application which result in the requirement for resource consents from the Horowhenua District Council and Manawatu/Whanganui Regional Council.

The councils will exclude consideration of effects associated with permitted activities and account for the affected party approvals and feedback from those who are potentially affected by the proposed land use and activities at site that provide for solar generation activities.

The most stringent activity classification is discretionary, however, this status appears to be largely driven by the lack of provision for renewable energy generation activities. The land use will be a new use of land within the rohe of Foxton, however the effects generated by the activity are no more than minor and will be present within the landscape, understood and can be readily avoided, remedied, or mitigated.

There are no statutory acknowledgements.

When assessing the effects on the environment and accounting for the interests of those adjacent to the site or potentially affected in the proximity no persons are considered to be affected in a minor or more than minor capacity.

Accordingly, it is appropriate that the application be considered on a non-notified basis.

4 ASSESSMENT OF ENVIRONMENTAL EFFECTS

4.1 BENEFITS OF THE PROPOSAL

The objective of the National Policy Statement for Renewable Energy is:

"To recognise the national significance of renewable electricity generation activities by providing for the development, operation, maintenance and upgrading of new and existing renewable electricity generation activities, such that the proportion of New Zealand's electricity generated from renewable energy sources increases to a level that meets or exceeds the New Zealand Government's national target for renewable electricity generation."

The propagation and development of solar energy farms contribute to a future in which New Zealand can provide for energy demands without adding to the global climate crisis. Central Government has issued a specific target of 90 per cent of electricity generated from renewable energy sources by 2025. This proposal will contribute to fulfilling this target.

The installation of a solar farm in the region would also align with Objective 3-2 of Horizon Regional Council's One Plan, which states the need for growth of renewable energy in the region.

With impacts of climate change comes pressures on our natural resources. Changes in weather patterns, rainfall and increased temperatures may increase the need for surface water abstraction. This in turn can limit the ability of hydroelectric dams to maintain the level needed for sufficient energy exchange. We have already seen this in the increase in electricity prices here in Aotearoa. In order for Aotearoa to meet its target for 2025, renewable energy sources will need to be expanded and diversified nationally utilising suitable resources.

On a district level, the proposal will have positive effects on the community. The development will increase job availability and employment during the construction and installation phase. This will lead to the facilitation of electrical apprenticeships as part of the applicant's operations. It will also aid in meeting a skills shortage for solar farm electricians that will become ever more necessary in the future. The proposal will contribute to the sustainability and future productivity of the Horowhenua power network and create reliable generative capacity in the face of global change.

4.2 EFFECTS ON BROADCAST, RADAR AND NAVIGATION SITES AND FACILITIES

North of the site is Foxpine Airpark, which specialises in microlight flying through a ground school and in-flight training. The runway runs parallel to the North boundary of the site (shown in Figure 1).

The federal aviation administration studies showed that due to the systems being low to the ground, it is extremely unlikely that they present a physical barrier to radar transmissions. The solar panels do not emit waves that could travel far enough to interfere with radar and any electrical equipment that can is buried beneath ground. This includes the inverters where the associated EMI fields would

be at ground level or below. The proposed site for this solar farm is not located on the airfield and the airpark is a small site unlikely to contain powerful radar equipment.

4.3 EFFECTS ON AIRCRAFT SAFETY

The effects of EMI on nearby aircraft operation have been assessed and has been determined to be low risk. To this end, Auckland international airport installed arrays on the roofs of Piers A and B in 2007.

There is little possibility of visual distraction or reflection in the path of an incoming or outgoing aircraft. Any glare observed by pilots on approach is thought to be akin to what they already experience from the likes of glass building and waterbodies (FAA,2021). This is due to the coating of the cells in order to minimise reflection. Instead of reflecting light back out to the atmosphere, the cells have internal etchings which increase absorption and the available light penetration to be converted to electrical energy.

In addition to this initial assessment, a glint and glare assessment produced by ITP Renewables has been provided. The key findings of this report are:

- The flightpaths for the airpark will receive zero glare from the proposed solar array.
- No observation points or routes received more than 20 minutes of glare per day.
- Vegetation and visual screening provided will augment any residual impact of glare from the site including on users of Wylie Road and residential points to the West of the farm.

4.4 EFFECTS ON IDENTIFIED SITES OF SIGNIFICANCE TO TANGATA WHENUA

There are no sites of significance to tangata whenua within the site or immediately surrounding the site according to the HDP. The Manawatu River used to follow the channel of the Foxton Loop to the South of the site, however the channel was diverted to allow direct flood flows to the ocean.

Consultation has been undertaken with tangata whenua.

4.5 EFFECTS ON AMENITY

The development will be situated in a predominantly rural setting with fields to the North, South and West of the site. To the Southeast of the site is a residential area with industry adjacent to the Eastern boundary.

The site falls within a rural zone with immediate land surrounding the is subject to industrial development and agricultural processes. The environment direct adjacent to the site on the Western side is comprised of pastoral land which is actively farmed.

4.5.1 Rural Character

The landscape and natural character of a place or environment is determined by individual perspective and experience. The site is within a rural setting but has been subject to modification and industrial influence in the immediate vicinity. The values of the area and the attributes that give rise to the perceived human experience are described in the landscape report. The impacts on the character of the site, whether they be moderately permanent, semi-permanent or transient, are assessed in the Landscape Report. These are summarised in the following sections.

4.5.1.1 Transient Experiential Effects

There will be disruption on site during the earthworks and installation of the array, however the site is not easily viewed by the public and is set back from viewpoints. Experiential effects will be low away from the site and will mostly be retained to the area of the proposal. Individuals visiting the area will be transitory and amenity receptors will not be detracted from as result of the proposal.

4.5.1.2 Semi- Permanent/ Moderately Permanent Experiential Effects

The site will be subject to physical modification through earthworks to the site. The Southern dune will be left undisturbed, however the dune landform patterning on site will be flattened to situate the array. As the surrounding land is highly modified in nature, the change arising from this is likely to be low. This will also be the case for change in land use and built attributes as the surrounding area is industrial in nature already.

4.5.2 Noise and Vibration

There are two forms of noise expected for the development: noise during construction and noise during operation. They are both assessed for their effects on the rural zone and receptors in the vicinity. It is important to note that once constructed the operation of the solar farm is passive in nature and any noise will be limited to staff on site undertaking minor maintenance which will produce noise at or below background levels of the adjacent properties.

4.5.2.1 Construction Noise

There will be a period of earthworks during the construction phase during which time heavy machinery will be onsite for the purpose of contouring the landscape. This will include excavators and dump trucks. The hours of operation for this activity will be limited to ensure potential noise issues for the nearby residential community avoided. In all other aspects noise activity will be not dissimilar to the background levels associated with permitted activities within the adjacent industrial zone, dairy farm, and airpark.

Fluctuating noise levels are identified by 'LAeq(t)' for 'equivalent' over a set time period of 15 minutes. 'LAFmax' is used to address short duration sounds while representing a maximum level of noise. Outside neighbouring buildings are subject to NZS 6803 limits. This equates to 1m from the facades and 1.2 to 1.5m above the relevant floor level.

The noise emitted during the construction period will fluctuate depending on the distance at which the noise is heard, and the equipment being used. Generally, noise emissions during this phase be between 75-80dB at a distance of 50 metres. The power tools used to erect and assemble the arrays have a typical noise emission level of around 90dB.

The minimum distance to the nearest residential dwellings approximately 20m to the Southeast on Herrington Street.

In order to minimise the potential for actual or potential impacts of noise to be experienced within the vicinity of the site, the applicant will implement the following measures:

- Noise will be limited to discreet events rather one long continuous sound.
- The dune on the Southern boundary will be retained to act as a barrier to sound travelling off site.
- Distance from surroundings particularly residential settings will mean that the noise impacts are alleviated and diluted as opposed to those heard on site.
- Construction will take place during the daytime to avoid disturbance to the neighbourhood during usual habitable hours.
- Equipment will not be left idle for long periods of time, any equipment left standing will be turned off to minimise potential impacts of continuous noise on site.

4.5.2.2 Operational Noise

Operational noise from the proposed solar farm will not exceed limits set out in the District Plan for activities within the rural zone. The limits are as follows:

(i) On any day -

- 7.00am – 7.00pm: 55dB LAeq (15mins)

- 7.00pm – 10.00pm: 50B LAeq (15mins)
- 10.00pm – 7.00am: 40dB LAeq (15mins)
- 10.00pm – 7.00am: 65dB LAmax

The panels do not move and therefore noise from machinery hydraulics will not occur. No noise is anticipated from any structural movement once the proposal is in operation. There will be noise from the cooling fans accompanying the converter units. This will take the form of a low hum. The temperature variations will mean that the cooling units will emit varying levels of noise depending on the output. In Aotearoa, the climate is temperate therefore maximum output will likely never occur. The maximum sound pressure of 63 dBA is measured at a temperature of 60 degrees Celsius at a 10m distance. The units will be placed centrally within the site in order to maximise distance to residences in the area.

There is approximately 20 metres of separation distance between the site of the proposed solar farm and the nearest residential zone.

4.5.3 Light Glare

The solar panels are a maximum 2.29m at their highest point from existing ground-level. The cells are coated in low-reflectivity material to minimise reflection of light and are set at low angles to avoid adverse effects of glare offsite.

Dunes to the South of the property will avoid exposure to sensitive receiving environments surrounding the site.

Glare has been assessed as part of the glint and glare report produced by ITP Renewables. No sensitive receptor was found to receive more than 20 minutes of glare per day from the solar array. Vegetation screens and existing embankments obstruct potential effects of glare on road users and surrounding properties. For this proposal, the effects of glare are less than minor.

4.6 EFFECTIVE SITING OF INFRASTRUCTURE

There is a requirement to acknowledge the need for the solar farm to be a at a site that provides the necessary orientation as well as a lack of existing infrastructure that might interfere with the operation of the solar farm.

Consideration has been given to other sites during initial investigation but this one has been selected for its proximity to a substation, a joint venture with community landowner and feedback from adjacent landowners. In addition, there is no requirement to stop an existing land use activity at the site as it is currently unutilised for any purpose (excluding informal public use to access other parts of Foxton).

4.7 RURAL ACCESS REQUIREMENTS

The access route is currently via the private road leading to Foxpine Airpark. This leads of Bergin Road to the West. As stated, Foxpine Airpark do retain an access easement over this track. This route for accessing the site from the collector road will be used for the proposal. To gain access directly onto site to carry out maintenance and construction of the array a new road will be constructed next to the point of connection. This will be in conjunction will peripheral roads on site to gain vehicular access to the full extent of the farm.

The traffic to and from site will consist of four utility vehicles daily parked within the site. These will be transporting personnel required to operate small diggers and install the arrays. An average of six truck deliveries is likely to occur over the course of the construction with up to two deliveries occurring on any one day. The materials for the fence, arrays, shed and fencing will be prefabricated therefore excessive material deliveries are not required. The delivery schedule will be dependent on the shipping times. Constraints surrounding delivery time from overseas and the ability to freight to the site will mean the delivery of materials will be intermittent over the course of construction.

4.8 PARKING AND LOADING SPACE DESIGN AND CONSTRUCTION

A parking area will be provided on site near to the connection point. This will be gravel surface and will be sufficient in protecting the rural environment from impacts of vehicular use and the low volume of traffic on site negates the need for anything further such as two-coat seal.

As a result of loading and construction, impacts off site are not expected to be more than minor. The amenities surrounding the area immediately North and adjacent to the site are industrial in nature already. Any access roads within the site will be setback from the boundary to ensure a buffer zone is maintained. This will be in addition to the creation of screens on site and the retainment of a dune along the Southern boundary.

4.9 ADAPTIVE MANAGEMENT

Adaptive management is required under case law when there is possibility that the effects of a proposal are uncertain and associated planning to avoid, remedy or mitigate such effects are uncertain by nature. Consent conditions are used to reflect an adaptive management approach where immediate effects can be foreseen and planned for but will be managed as when they become apparent throughout the process.

This proposal does not require adaptive management as effects have been foreseen and are not uncertain so they can be planned for. In this respect the measures used to avoid, remedy, or mitigate the associated effects are not uncertain and will be implemented with certainty.

4.10 REVERSE SENSITIVITY EFFECTS

The proposed solar farm will be able to operate with efficiency in the immediate vicinity of industrial and rural activities without the potential of reverse sensitivity effects.

5 STATUTORY CONSIDERATIONS

5.1 PART 2 OF THE RESOURCE MANAGEMENT ACT (1991)

Schedule 4 requires that assessment be made against Part 2 of the RMA. – any relevant provisions of a document referred to in Section 104 (1) (b).

Part 2 Purpose – to promote sustainable management of natural and physical resources (overall of the RMA)

Case law findings have directed that decision makers should now only have recourse to Part 2 of the RMA, including higher order policy documents, if it is determined that:

1. Any part or the whole of the relevant plan(s) are invalid;

2. The relevant plan(s) did not provide complete coverage of the Part 2 matters;

3. There is uncertainty of the meaning of provisions as they affect Part 2.

Decision makers need only to give due consideration to Part 2 of the RMA if such matters addressed have not already been covered in the relevant planning documents. The operative One Plan and Horowhenua District Plan are comprehensive documents providing certainty and coverage of the matters that need to be addressed for consideration of the application. There is no requirement to address Part 2 matters on that basis.

5.2 SECTION 104 (1) (b) OF THE RMA

Section 104 (1) (b) of the RMA specifies adherence to the relevant plans. These include:

(i) a national environmental standard;
(ii) other regulations;
(iii) a national policy statement;
(iv) a New Zealand coastal policy statement;
(v) a regional policy statement or proposed regional policy statement;
(vi) a plan or proposed plan;

5.3 NATIONAL ENVIRONMENTAL STANDARDS

There are no National Environmental Standards applicable to this proposal.

5.3.1 Other Regulations

This proposal does not necessitate the review of any further regulations as they are not relevant and do not apply to the consent process.

5.3.2 National Policy Statements

5.3.2.1 NPSREG 2011

The NPSREG 2011 applies to renewable electricity generation activities at any scale, and covers the construction, operation, maintenance and upgrading of new and existing structures associated with renewable electricity generation. The NPS REG confirms that:

- renewable electricity generation, regardless of scale, makes a crucial contribution to the well-being of New Zealand, its people and the environment, and any reductions in existing REG will compromise achievement of the Government's renewable electricity target of 90% of electricity from renewable sources by 2025; and
- the development, operation, maintenance and upgrading of new and existing renewable electricity activities throughout New Zealand, and the associated benefits of REG, are matters of national significance.

The NPSREG 2011 contains one objective that states;

To recognise the national significance of renewable electricity generation activities by providing for the development, operation, maintenance and upgrading of new and existing renewable electricity generation activities, such that the proportion of New Zealand's electricity generated from renewable energy sources increases to a level that meets or exceeds the New Zealand Government's national target for renewable electricity generation. Policies A, B, and C are of most relevance to this proposal. In accordance with the NPSREG 2011, the RPS, and WDP all give full effect to the NPSREG 2011. As such, a full assessment of the remainder of the relevant provisions of this document is not conducted at this point and are instead addressed in the following sections.

5.3.2.2 NPSFM 2020

The National Policy Statement for Freshwater Management emphasises the importance of prioritising the health of freshwater bodies above the health of people as well as their economic cultural wellbeing. This hierarchy is displayed in its overall objectives. The NPSFM requires local authorities to cohesively manage waterbodies to ensure they give effect to Te Mana O te Wai and ensure longevity of the resources in the face of climate change.

(1) Adopting an integrated approach, ki uta ki tai, as required by Te Mana o te Wai, requires that local authorities must:

(a) recognise the interconnectedness of the whole environment, from the mountains and lakes, down the rivers to hāpua (lagoons), wahapū (estuaries) and to the sea; and

(b) recognise interactions between freshwater, land, water bodies, ecosystems, and receiving environments; and

(c) manage freshwater, and land use and development, in catchments in an integrated and sustainable way to avoid, remedy, or mitigate adverse effects, including cumulative effects, on the health and well-being of water bodies, freshwater ecosystems, and receiving environments; and

(d) encourage the co-ordination and sequencing of regional or urban growth.

Throughout construction of the solar farm, storm run-off will be manged under the sediment and erosion plan. There will be no impact on water quality as a result of the works or operation of the site.

5.3.2.3 New Zealand Coastal Policy Statement

This proposal will not be sited in the vicinity of the coastal environment and is therefore not subject to the New Zealand Coastal Policy Statement.

5.3.3 REGIONAL POLICY STATEMENT – THE ONE PLAN

Renewable energy infrastructure is recognised as being as a matter of national significance in the national policy statement for renewable energy. This is reiterated in the regional policy statement. Electricity is considered of necessary importance for the day-to-day living, livelihood, and transport. It is important to allow for new sites of electricity generation.

Renewable forms of energy are intended to make up 90% of New Zealand's electricity generation by 2025 if the Government target is to be met. In order for the region to contribute to this target in the face of climate change, available renewable resources in the region must be available for generative establishment where possible.

The regional Council has stated that to this effect it must recognise the need to provide for the development of renewable energy. In order to achieve this, the regional council has laid out provisions in The One Plan for the regulation of renewable energy ensuring the continuity in

planning across the region. The relevant objectives and policies within The One Plan are assessed with regards to this proposal in Table 3.

Table 4: Assessment of the One Plan objectives and policies relevant to this proposal.

Objective	Policy	Assessment
Objective 2-1 (a): To have regard to the mauri* of natural and physical resources^ to enable hapū* and iwi* to provide for their social, economic, and cultural wellbeing. (b) Kaitiakitanga^ must be given particular regard and the relationship of hapū* and iwi* with their ancestral lands^, water^, sites*, wāhi tapu* and other taonga* (including wāhi tūpuna*) must be recognised and provided for through resource management processes.	Policy 2-1: Hapū* and iwi* involvement in resource management – The Regional Council must foster kaitiakitanga^ and the relationship between hapū* and iwi* and their ancestral lands^, water^, sites*, wāhi tapu* and other taonga* (including wāhi tūpuna*) through increased involvement of hapū* and iwi* in resource management.	During assessment of environmental effects for this site, consultation with representative hapū has taken place. This has been done to recognise areas of significance to Iwi within the site of the proposal and have regard to areas of concern that arises from this.
Objective 3-2: Energy An improvement in the efficiency of the end use of energy and an increase in the use of renewable energy^ resources within the Region	Policy 3-6: Renewable energy^ (a) The Regional Council and Territorial Authorities^ must have particular regard to: (i) the benefits of the use and development of renewable energy^ resources including: (A) contributing to reduction in greenhouse gases, (B) reduced dependency on imported energy sources, Infrastructure, Energy, Waste*, Hazardous Substances* and Contaminated Land 3-8 One Plan - 2014 (C) reduced exposure to fossil fuel price volatility, and (D) security of supply for current and future	This proposal will increase efficiency of energy generation in the region and will lead to further energy security in the face of global shortages. The ability of the natural resources to generate further energy will be utilised and further enhance the ability of both the region and the country to develop greener energy strategies.

Objective	Policy	Assessment
	generations, (ii) the Region's potential for the use and development of renewable energy^ resources, and (iii) the need for renewable energy^ activities to locate where the renewable energy^ resource is located, and (iv) the benefits of enabling the increased generation capacity and efficiency of existing renewable electricity generation facilities, and (v) the logistical or technical practicalities associated with developing, upgrading, operating or maintaining an established renewable electricity generation activity. (b) The Regional Council and Territorial Authorities^ must generally not restrict the use of small do	
Objective 3-1: Infrastructure^ and other physical resources of regional or national importance	Policy 3-1: Benefits of infrastructure^ and other physical resources of regional or national importance (i) facilities for the generation of more than 1 MW of electricity and its supporting infrastructure^ where the electricity generated is supplied to the electricity distribution and transmission networks	This proposal will generate more than 1 MW of electricity and will contribute to the local grid.

Objective	Policy	Assessment
Objective 4-2: Regulating potential causes of accelerated erosion*	(a) In order to achieve Objective 4-2, the Regional Council must regulate vegetation clearance*, land disturbance*, forestry* and cultivation* through rules^ in this Plan and decisions on resource consents^, so as to minimise the risk of accelerated erosion, minimise discharges of sediment to water, and maintain the benefits of riparian vegetation for water bodies^. c) The Regional Council will generally allow small scale vegetation clearance*, land disturbance*, forestry* and cultivation* to be undertaken without the need for a resource consent^ if conditions^ are met. Vegetation clearance* and land disturbance* require a resource consent^ if they are undertaken adjacent to some water bodies^ (including certain wetlands^) in Hill Country Erosion Management Areas* or in coastal foredune* areas. Any other large scale land disturbance* will also require a resource consent^.	The activity will be undertaken in accordance with a sediment and erosion control plan. Water quality in the area will not be impacted by discharge from the site. The site is not near any sites of significance or water in close proximity to waterbodies.

5.3.4 Horowhenua District Plan

The district plan is required to align with the policies set out in The One Plan to avoid inconsistency with approach to natural resources across the region. The provisions laid out in the District Plan that are applicable to the proposal are addressed in Table 4.

Table 5: Assessment of Horowhenua District Council objectives and policies relevant to this proposal.

Objective 1.3.1 Sites of Cultural Significance To protect areas and sites of cultural significance, wāhi tapu, wāhi tūpuna and other taonga from the adverse effects of inappropriate subdivision, use, and development of resources.	
Policy 1.3.3 Avoid or appropriately mitigate any adverse effects of activities that could destroy or damage the cultural values associated with an area or site of cultural significance identified in the District Plan.	Throughout the consent process, consultation has been undertaken with Tāngata Whenua. In doing so, cultural values and areas of significance have been addressed.
Policy 1.3.5 Recognise and take into account any adverse effects which would degrade the cultural values of areas and sites of cultural significance, wāhi tapu, wāhi tūpuna and other taonga when assessing proposals for the subdivision, use and development of resources.	
Objective 2.4.1 Land Use Activities – Nature, Character, Amenity Values and Servicing To enable primary production activities and other rural based land uses to function efficiently and effectively in the Rural Zone, while avoiding, remedying, or mitigating the adverse effects of activities, including reverse sensitivity effects caused by new activities on existing activities, in a way that maintains and enhances the character and amenity values of the rural environment.	
Policy 2.4.4 Control and manage the establishment and operation of a range of other land use activities, including sensitive activities, in the rural environment to ensure their adverse effects on the environment (including reverse sensitivity effects on existing lawfully established activities) are avoided, remedied, or mitigated.	No adverse effects are expected as a result of this proposal. Earthworks will be manged under a sediment and erosion plan to ensure any discharge from site does not impact water quality in the area.

Policy 2.4.5 Manage any activity which does not meet minimum standards by assessing on a case-by case basis to ensure the adverse effects on the environment are avoided, remedied, or mitigated.	Effects of the proposal are assessed as being no more than minor. Any potential affects will be avoided, remedied, or mitigated.
Policy 2.4.7 Avoid, remedy, or mitigate the impact of buildings on the rural landscape and maintain overall low building density and building height throughout the rural environment.	Building height will be in keeping. The use of margin and vegetation screens will ensure the project is in keeping with industrialised rural surroundings.
Policy 2.4.10 Avoid, remedy, or mitigate adverse effects on rural privacy and rural character in the Rural Zone by maintaining road and site boundary setbacks for all buildings, while recognising the degree of privacy and rural spaciousness is different in areas comprising existing smaller rural-residential lots	Site boundaries will be maintained throughout.
Policy 2.4.13 Avoid, remedy, or mitigate any adverse effects upon residential properties or road safety caused by lighting or glare from any source.	The proposal will be set back from residential properties and a screen will surround the site to ensure landscape effects are avoided.
Policy 2.4.17 Maintain overall day and night-time noise conditions at levels compatible with the amenity and activity present in the rural environment	Noise levels will be in keeping with limits for the rural zone during operation.
Policy 2.4.18 Ensure that effects of increased traffic or changed traffic type or change to road access do not compromise the safe and efficient operation of any road or adversely affect the safe and convenient movement of people on public roads.	Traffic to and from site will be minimal and will compromise the safety of efficiency of surrounding road infrastructure.
Policy 2.4.19 Provide for a limited amount of signage located on the site to which the activity relates to minimise the effects on the rural environment.	Signage will be erected on site during and after construction.
Objective 12.2.1 Energy To recognise and provide for the efficient use of energy and the development and use of renewable electricity generation infrastructure, where the adverse effects on the environment can be avoided, remedied, or mitigated.	

Policy 12.2.4 Manage the establishment and development of new renewable electricity generation facilities to ensure the adverse environmental effects that are more than minor are avoided, remedied, or mitigated.	Effects of this proposal for solar energy generation will incur no more than minor effects. This has been assessed in detail in the AEE.
Policy 12.2.5 Recognise the contribution of renewable energy use and development to the well-being of the District, Region, and Nation.	In granting the proposal consent, energy efficiency in the district will be increased while adverse effects of this new infrastructure will be avoided.
Policy 12.2.6 Avoid, remedy, or mitigate adverse effects on the environment from renewable electricity generation and distribution activities, specifically on those parts of the environment most sensitive to change.	The site of the proposal is not highly modified already and is not considered a sensitive site for the sake of this application.
Policy 12.2.7 Manage effects of renewable electricity generation by: (a) avoiding significant adverse cumulative effects on the characteristics and values of Outstanding Natural Features and Landscapes; and (b) avoiding any other adverse effects of renewable electricity generation facilities on the characteristics and values of Outstanding Natural Features and Landscapes. Where avoidance is not reasonably practical, adverse effects need to be remedies or mitigated.	No outstanding natural features or landscapes will be impacted by the proposal.
Policy 12.2.8 Ensure development of renewable electricity generation facilities minimises visual interruption or intrusion of views of the Tararua Ranges when viewed from public spaces within the Levin urban area	Views of the Tararua Ranges will not be impacted by the proposal.
Policy 12.2.9 Recognise the technical, locational, and operational requirements of energy generation and distribution operations and infrastructure in setting environmental standards and assessing applications for resource consent.	As stated, the site selected for this proposal meets criteria for suitability and viability of solar generation. This is in conjunction with the industrial surroundings already in place and the modified nature of the land.

Policy 12.2.10 Provide for the identification and assessment by energy generators and developers, of potential sites and energy sources for renewable electricity generation.	This site has been identified and assessed as being viable for solar generation.

6 Conclusion

This application for resource consent in regard to installation and operation of a solar farm in Foxton is consistent with Section 4 and Section 104C of the RMA. Activities outlined within the proposal are restricted discretionary under the Horowhenua District Council Plan. The activities listed can be granted as the effects associated with them are assessed to be no less than minor. The proposal is consistent with the relevant policy documents outlined and there is no reason under Part 2 of The RMA as to why consent should not be granted.

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MEMORANDUM

TO: HOROWHENUA DISTRICT COUNCIL

FROM: EMILY BURNS – THE CATALYST GROUP

DATE: 21 JUNE 2022

SUBJECT: EARTHWORKS AT FOXTON

INTRODUCTION

As requested in the Section 92 request, the following memorandum details the earthworks to be carried out at Bergin Road, Foxton including a further analysis of the relevant provisions. In addition to this, topography surveys have been supplied as well as cut and fill volumes.

DETAILS OF EARTHWORKS TO BE CARRIED OUT

The site is comprised of low lying dune land with two large dunes crossing perpendicular to the site, one lining the Southern boundary and the tail-end of a parabolic dune at the Western side. These are approximately 20 metres in height, as shown in the topography survey. Further parabolic dunes run through the centre of the site and along the Northern boundary. These are less than 20 metres in height.

Accordingly, the site is undulating in nature and requires extensive earthworks to flatten the ground in preparation for the solar array. It is proposed that the Southern boundary dune will be undisturbed and act as a screen for properties to the South of the site. The additional dunes will be levelled to accommodate the array. The total area subjected to earthworks will be 284,400.621 square metres. On site, there will be a cut volume of 207,424.70 cubic metres and a fill volume of 152,024.29 cubic metres. The net amount of material to be cut will therefore equate to 55,400.41 cubic metres. An analysis of the planning provisions for earthworks is provided below.

Rule and Relevant Document	Likely Overall Classification	Deciding Authorities	Comment
19.6.13 Earthworks-Specific Landscape Domains (a) Earthworks, other than cut for a building platform, on land that is not an Outstanding Natural Landscape and Feature, shall not exceed the following: (iii) Foxton Dune fields Landscape Domain • 3 metres (cut or fill) measured vertically • Where earthworks exceed 3 metres (cut or fill) measured vertically, those earthworks shall not exceed 5 metres (cut or fill) measured vertically and shall not exceed a distance of 50 metres in continuous horizontal length. • Where earthworks are to be undertaken on a dune, the vertical height of the dune, or any part of that dune,	Discretionary	Horowhenua District Council	Within the rural zone, the site falls with the Foxton Dune fields domain as shown in planning map 38. In this instance, Rule 19.6.13(a)(iii) is triggered. Earthworks on the Western dune as marked in the topography survey, will exceed 3 metres cut. The entire dune will be levelled. The height of this dune is shown as approximately 20 metres. The dune on the Southern boundary of the site is to be undisturbed.

Rule and Relevant Document	Likely Overall Classification	Deciding Authorities	Comment
prior to the earthworks shall be no greater at any point than 10 metres from toe to summit.			
(Horowhenua District Plan) 13-2 Large-scale land disturbance*, including earthworks – Except as regulated by Rules 13-6, 13-8 and 13-9, any land disturbance* pursuant to s9(2) RMA of a total area greater than 2500 m2 per property* per 12-month period and any ancillary: (a) diversion of water^ pursuant to s14(2) RMA on the land^ where the land disturbance* is undertaken, or (b) discharge^ of sediment into water^ pursuant to s15(1) RMA resulting from the land disturbance*. (Horizons Regional Plan) a) The activity must not take place on land^ that is within a coastal foredune*. (b) The activity must be undertaken in accordance with an Erosion and Sediment Control Plan*. (c) Any ancillary discharge^ of sediment into water^ must not, after reasonable mixing, cause the receiving water body^ to breach the water quality standards for visual clarity set out in Schedule E for that water body^. (d) The activity must not occur on land^ that is in, or within 5 m of: (i) the bed^ of a river^ that is permanently flowing, (ii) the bed^ of a river^ that is not permanently flowing and has an active bed* width greater than 1 m, (iii) the bed^ of a lake^.	Controlled	Horizons Regional Council	The earthworks will be of short duration in order to prepare the land for the array. The site is of varying topography, however the vegetation onsite is comprised of weeds. The site is fairly undulating and significant earthworks will be required to flatten the site. The site is surrounded by industry and agricultural land use. The applicant has devised a sediment and erosion plan to be implement throughout the construction and post- construction periods. The site does not fall within 5 metres of a riverbed or lake bed. The activity will not occur within 10 metres of wetland, trout spawning site or site of aquatic significance.

Rule and Relevant Document	Likely Overall Classification	Deciding Authorities	Comment
(e) The activity must not occur on land^ that is in, or within 10 m of: (i) A wetland^ as identified in Schedule F, (ii) Sites valued for Trout Spawning as identified in Schedule B, (iii) Sites of Significance - Aquatic as identified in Schedule B.			

CONCLUSIONS AND RECOMMENDATIONS

This activity has been applied for as a discretionary activity in respect of the Horowhenua District Council District Plan. The proposal requires a controlled activity consent from Horizons Regional Council under the guidance provided by Rule 13-2.

Glint and Glare Assessment

Foxton Solar Farm

Revision 03
July 2022

ENGINEERING | STRATEGY | ANALYTICS | CONSTRUCTION

DOCUMENT CONTROL

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ABOUT THIS REPORT

This report was commissioned by Far North Solar Farm Limited to assess the glint and glare impact of the proposed Foxton Solar Farm.

ABBREVIATIONS

AC	Alternating current
CASA	Civil Aviation Safety Authority
DC	Direct current
FAA	Federal Aviation Administration (United States)
ha	Hectare
ITP	ITP Renewables
MW	Megawatt, unit of power (1 million Watts)
MWp	Megawatt-peak, unit of power at standard test conditions; used to indicate PV system capacity
NZ	New Zealand
OP	Observation point
PV	Photovoltaic
SGHAT	Solar Glare Hazard Analysis Tool

TABLES

FIGURES

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1 INTRODUCTION

1.1 Overview

Far North Solar Farm Limited (FNSF) has requested a glint and glare assessment for a proposed solar photovoltaic (PV) installation near Foxton, New Zealand. This assessment is to form part of the Development Application for the project. It includes:

- Identification of potential receptors of glint and glare from the proposed solar farm
- Assessment of the glint and glare hazard using the Solar Glare Hazard Analysis Tool (SGHAT) GlareGauge analysis

1.2 Glint and Glare

Glint is a momentary flash of bright light, while **glare** is a continuous source of excessive brightness relative to ambient lighting (Federal Aviation Administration [FAA], 2018). This can occur when light reflected off a surface (reflector) is viewed by a person (receptor). Typically, occurs in instances when either the receptor or the reflector is moving; while glare occurs when the reflector and receptor are completely or close to stationary.

For a transparent material (e.g., glass, water) the quantity of light reflected depends on the surface itself (i.e., material and texture), and the angle at which the light intercepts it (angle of incidence). A higher angle of incidence will result in a higher proportion of light being reflected, as shown in Figure 1.

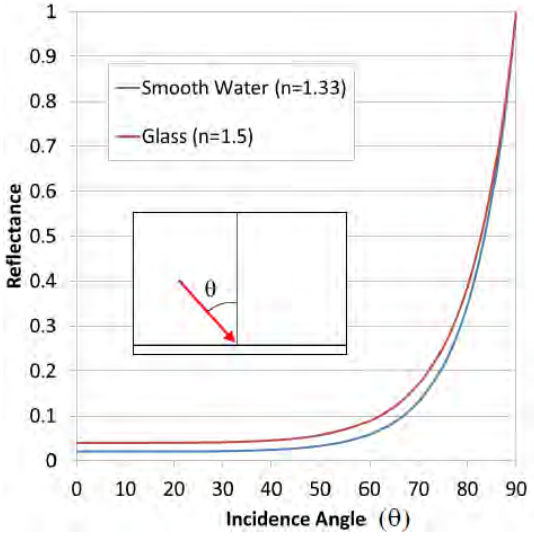


Figure 1: Angles of incidence and increased levels of reflected light

Potential visual impacts from glint and glare include distraction and temporary after-image; at its worst, it can cause retinal burn. The ocular hazard caused by glint or glare is a function of:

1. The intensity of the glare upon the eye (retinal irradiance)
2. The subtended angle of the glare source (i.e., the extent to which the glare occupies the receptor's field of vision; dependent on size and distance of the reflector).

The severity of the ocular hazard can be divided into three levels, as shown in Figure 2:

- 'Green' glare: Low potential for temporary after-image
- 'Yellow' glare: Potential for temporary after-image
- 'Red' glare: Retinal burn, not expected for PV

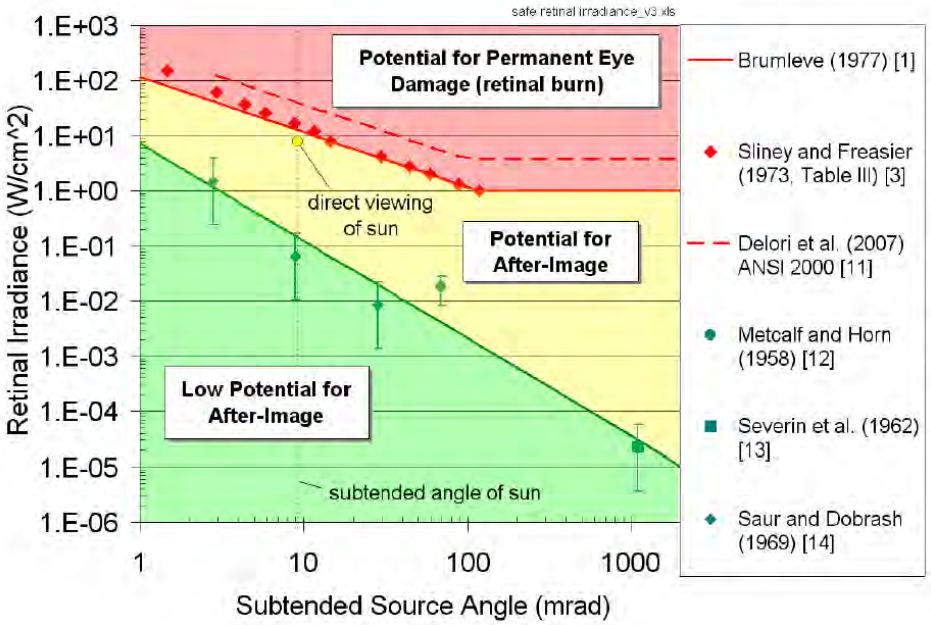


Figure 2: Classification of glare based on severity of ocular effects

1.3 Glare from Solar PV

Solar photovoltaic (PV) cells are designed to absorb as much light as possible to maximise efficiency (generally around 98% of the light received). To limit reflection, solar cells are constructed from dark, light-absorbing material and are treated with an anti-reflective coating. PV modules generate less glare than many other surfaces, as shown in Figure 3.

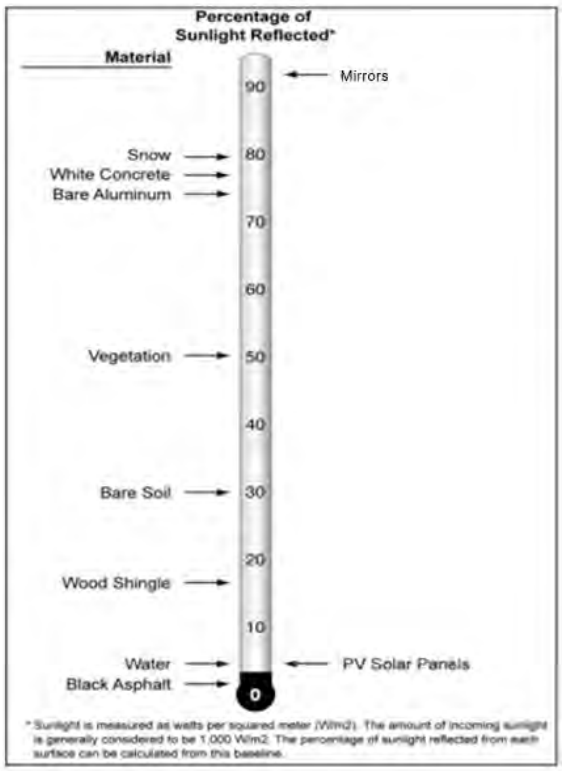


Figure 3: Typical percentage of sunlight reflected from different surfaces (Source: Adapted from Journal of Airport Management, 2014)

The small percentage of light reflected from PV modules varies depending on the angle of incidence. Figure 4 shows an example of this with a solar module. A larger angle of incidence will result in a higher percentage of reflected light.

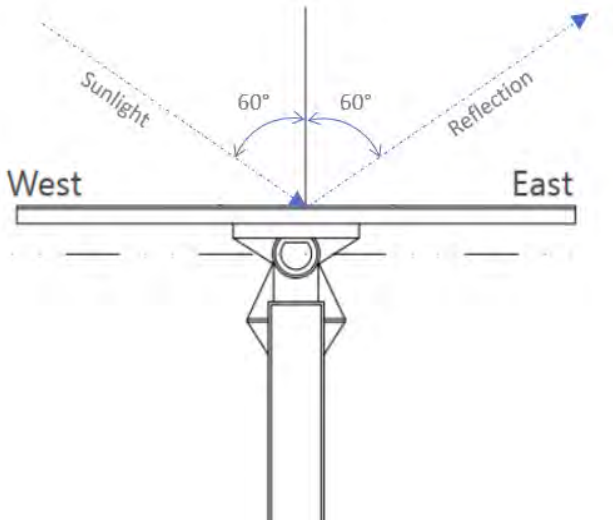


Figure 4: Typical sunlight reflection off the surface of a solar module

The two most common PV mounting structures are fixed tilt and single axis tracking. Fixed tilt arrays are stationary, while single axis tracking arrays rotate the receiving surface of the modules from east to west throughout the day as the sun moves across the sky.

In a fixed tilt PV array, since the sun is moving but the modules are stationary, the angle of incidence varies as the sun moves across the sky. It is smallest around noon when the sun is overhead and largest in the early morning and late afternoon when the sun is near the horizon. There is therefore a higher potential for glare at these times.

The angle of incidence for a single axis tracking system varies less as the reflective surface of the modules rotates on a horizontal axis to follow the sun. Single axis tracking arrays therefore generate less glare than fixed tilt arrays. The tracking varies throughout the year to match seasonal changes in the sun's path (see Figure 5).

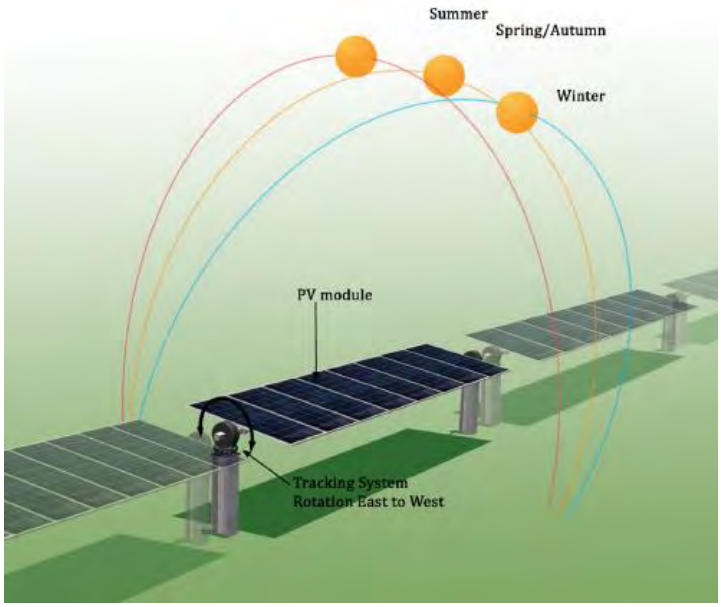


Figure 5: Sun position relative to PV module mounted on a horizontal single axis tracking system

2 PROJECT DESCRIPTION

2.1 Site Overview

FNSF is proposing a solar farm at the location described in Table 1. The site is located adjacent to Foxton Airpark.

Table 1: Site Information

Parameter	Description
Lot/DP	7/68629, 3/27011
Street address	Bergin Road, Foxton
Council	Horowhenua District Council
Project area	Approx. 38 ha
Current land use	Vacant

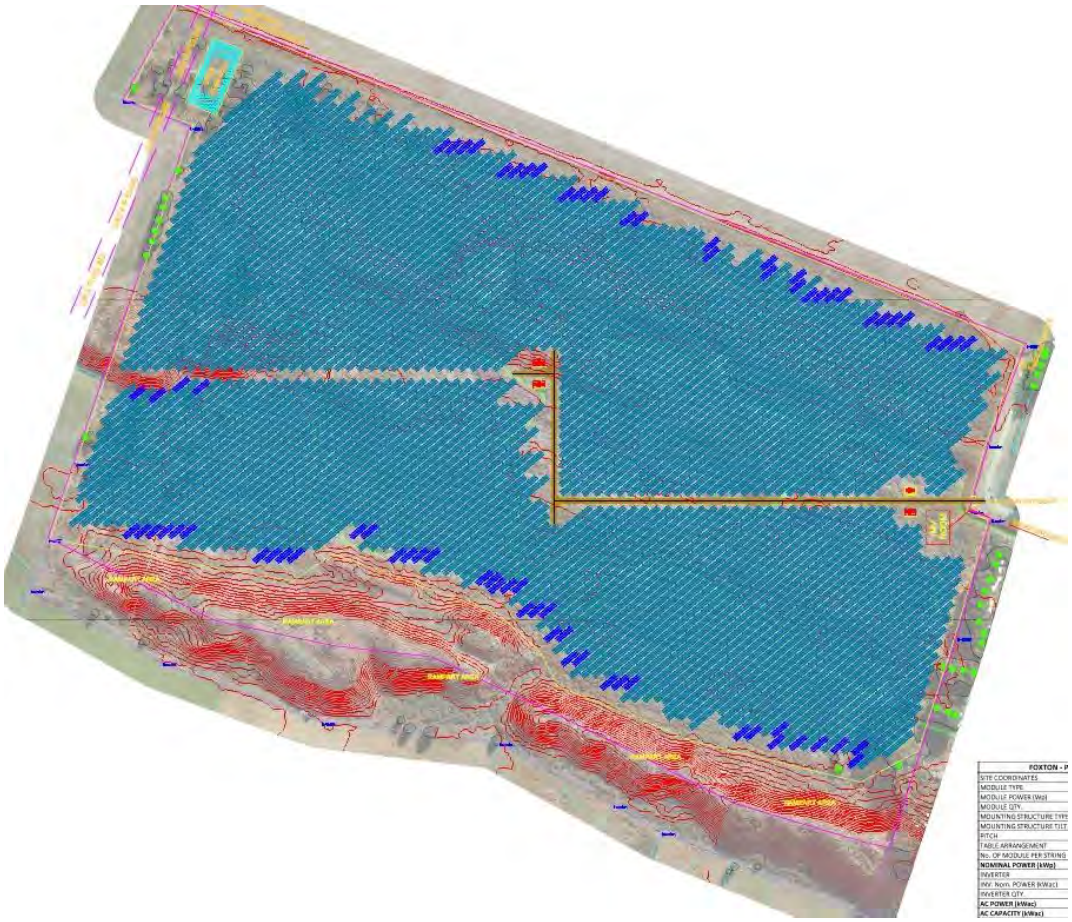


Figure 6: Proposed 38 ha solar far m site and surrounding area

2.2 Solar Farm Details

Table 2 summarises the details of the proposed solar farm.

Table 2: Solar farm information

Parameter	Description
Solar farm name	Foxton Solar Farm
AC capacity	29 MW
DC capacity	39.5 MW
Mounting system	Fixed-tilt

FNSF is proposing to construct a solar farm with a DC capacity of 39.5 MWp and AC output of 29 MW on an approximately 38 ha site. The site is currently used for cattle grazing.

There are to be approximately 72,000 solar modules installed in 1,300 fixed-tilt tables (each table being approximately 32 m long) running north-east to south-west. There is approximately 6.3 m spacing between each row. The maximum height of each table is approximately 2 m.

The solar farm will include 8 inverters located at 4 power stations. Each power station incorporates high/medium voltage switchgear, transformers, and two 4.3 MW inverters. The power stations are ground mounted.

The mounting system is constructed on piles that are driven into the ground. During construction there is expected to be 30 personnel on site working from 7 am – 5 pm Monday to Saturday. The construction is expected to take approximately 12 months. Once operational the site will be unmanned. Regular maintenance is expected to be carried out over the 25-year operational lifetime.

Solar panels and related infrastructure will be decommissioned and removed upon cessation of operations. This is likely to occur within two years of the end of the project. The site will either be returned to the pre-development land use of grazing, or the system will be repowered with new solar panels and related infrastructure.

3 ANALYSIS

3.1 Overview

The Solar Glare Hazard Analysis Tool (SGHAT) was developed by Sandia National Laboratories to evaluate glare resulting from solar farms at different viewpoints, based on the location, orientation, and specifications of the PV modules. This tool was required by the United States FAA for glare hazard analysis near airports until 2021 and is also recognised by the Australian Government Civil Aviation Safety Authority (CASA).

The GlareGauge software uses SGHAT to provide an indication of the type of glare expected at each potential receptor. It runs with a simulation timestep of one minute. Glint lasting for less than one minute is unlikely to occur from the sun on PV modules due to their slow movement.

Table 3 details the parameters used in the SGHAT model. GlareGauge default settings were adopted for the analysis time interval, direct normal irradiance, observer eye characteristics and slope error. The height of the observation points for road and rail users was assumed to be 1.5 m for a car driver, and 2.5 m for a truck or train driver. The height for a person standing was assumed to be 1.65 m.

Table 3: SGHAT specification inputs

Parameters	Input
Time zone	UTC+12:00
Module surface material	Smooth glass with ARC (anti-reflective coating)
Module tilt	20°
Module orientation	320°
Height of modules above ground	1.48 m (height from the ground to the table centre)
Flight path threshold height	15 m
Flight path glide length	2 km
Flight path glide slope	3°
Flight path vertical view restriction	30°
Flight path azimuthal view restriction	50°

3.2 Potential Receptors

This assessment considers potential visual receptors (e.g., residences and road users) within 2 km of the site. There is no formal guidance on the maximum distance for glint and glare assessments; however, the significance of a reflection decreases with distance for two main reasons:

1. The solar farm appears smaller (smaller subtended angle), and glare has less impact
2. Visual obstructions (e.g., terrain, vegetation) may block the view of the solar farm

Glint and glare impacts beyond 2 km are highly unlikely. This choice of distance is conservative and is based on existing studies and assessment experience. Nineteen observation points, five road routes, and two flight paths were identified as potential visual receptors, as shown in Figure 7. While a greater number of observation points were considered, some were discounted based on large stands of trees, hills and other structures acting as visual barriers.

Figure 7: Potential visual receptors within 2 km of the site

3.3 Assumptions

The visual impact of solar farms depends on the scale and type of infrastructure, the prominence and topography of the site relative to the surrounding environment, and any proposed screening measures to reduce visibility of the site. Some potential viewpoints were discounted because of significant existing features (such as trees or buildings). Minor screening (such as roadside vegetation) was not assessed in detail however, as GlareGauge does not model obstructions. The GlareGauge analysis results are therefore considered conservative as the model assumes there is no screening.

Atmospheric conditions such as cloud cover will also influence light reflection and the resulting impact on visual receptors. Varying atmospheric conditions have not been accounted for in the GlareGauge analysis. The GlareGauge analysis assumes clear sky conditions, with a peak direct normal irradiance (DNI) of 1,000 W/m^2 which varies throughout the day.

3.4 Results

The results of the GlareGauge analysis (attached in Appendix A) are summarised in Table 4. The analysis identified no green glare and 13,726 minutes (229 hours) of cumulative yellow glare spread across multiple points and routes.

The glare received each day varied across the year. For observation points where some glare occurred, the impact is described qualitatively. No flight paths, observation points, or routes received more than 20 min of glare in any single day (see Appendix A for full results). The time of day at which glare was observed varied between observation points and across the year. In general, most glare occurred in the early mornings or late evenings.

Table 4: Glare potential at each receptor

Observation Points	Location / Coordinates	'Green' glare (min/year)	'Yellow' glare (min/year)	Glare potential (per day)
FP 1 Western Approach	Extending from western end	0	0	None
FP 2 Eastern Approach	Extending from eastern end	0	0	None
OP 1	-40.4580, 175.2773	0	0	None
OP 2	-40.4569, 175.2733	0	0	None
OP 3	-40.4565, 175.2717	0	0	None
OP 4	-40.4515, 175.2674	0	0	None
OP 5	-40.4490, 175.2682	0	0	None

Observation Points	Location / Coordinates	'Green' glare (min/year)	'Yellow' glare (min/year)	Glare potential (per day)
OP 6	-40.4592, 175.2594	0	2723	Up to 14 min of glare between 7:30 am and 8:30 am from mid-August to late April.
OP 7	-40.4604, 175.2570	0	2762	Up to 15 min of glare between 7:30 am and 8:30 am from early January to late April. Up to 15 min of glare between 7:30 am and 8:30 am from early August to late November.
OP 8	-40.4608, 175.2568	0	2623	Up to 15 min of glare between 8:00 am and 8:30 am from mid-January to early May. Up to 15 min of glare between 7:30 am and 8:30 am from early August to mid-November.
OP 9	-40.4602, 175.2553	0	2361	Up to 15 min of glare between 8:00 am and 8:30 am from early February to late April. Up to 15 min of glare between 7:30 am and 8:30 am from mid-August to late November.
OP 10	-40.4641, 175.2673	0	0	None
OP 11	-40.4665, 175.2651	0	0	None
OP 12	-40.4662, 175.2701	0	0	None
OP 13	-40.4680, 175.2684	0	0	None
OP 14	-40.4652, 175.2710	0	0	None
OP 15	-40.4642, 175.2723	0	0	None
OP 16	-40.4658, 175.2734	0	0	None
OP 17	-40.4650, 175.2741	0	0	None
OP 18	-40.4644, 175.2745	0	0	None
OP 19	-40.4638, 175.2749	0	0	None
Wylie Rd	West	0	3257	Up to 20 min of glare between 8:00 am and 8:30 am from mid-March to late June. Up to 20 min of glare between 7:30 am and 9:00 am from late June to late September.

Observation Points	Location / Coordinates	'Green' glare (min/year)	'Yellow' glare (min/year)	Glare potential (per day)
NZ State Hwy 1 (car)	East	0	0	None
NZ State Hwy 1 (truck)	East	0	0	None
Victoria St to Bergin Rd	East	0	0	None
Foxton Racecourse	East	0	0	None
Runway access driveway	North and east	0	0	None
Total		**0**	**13726**	

4 SUMMARY

The results of the GlareGauge analysis indicated that four observations points and one road routes received yellow glare, and both flight paths received zero glare. Yellow glare has the potential to cause after-image to observers, while green glare has low potential to cause after image. In general, most of the glare occurred during early mornings and late evenings. No observation points or routes received more than 20 min of glare in any single day.

Existing roadside vegetation, structures, and embankments provide a physical obstruction between the solar farm and road users on Wylie Rd, and residents at Observation Points 6, 7, 8, and 9. New vegetation screens on the western boundary have been proposed in the "Assessment of landscape and visual amenity effects". This new vegetation will augment the existing screening and mitigate any residual impact of glare on Wylie Road and Observation Points 6, 7, 8, and 9.

5 REFERENCES

Federal Aviation Administration (FAA), 2018. Solar Guide: Technical Guidance for Evaluating Selected Solar Technologies on Airports. Retrieved from the FAA website: https://www.faa.gov/airports/environmental/

Thompson, R., Ave, I., Anne, D., Jan, M., David, S. and Robert, C., 2013. Interim policy, FAA review of solar energy system projects on federally obligated airports.

Barrett, S., Devita, P., Ho, C. and Miller, B., 2014. Energy technologies' compatibility with airports and airspace: Guidance for aviation and energy planners. Journal of Airport Management, 8(4), pp.318-326.

APPENDIX A. FORGESOLAR GLARE ANALYSIS

FORGESOLAR GLARE ANALYSIS

Project: **22083 Foxton Solar Farm**
Proposed 39 MWp solar farm at Foxton Airpark, Foxton New Zealand

Site configuration: **22083 - Foxton SF North 320deg**

Client: Far North Solar Farm Limited

Site description: Rotated fixed tilt array

Created 25 Jul, 2022
Updated 25 Jul, 2022
Time-step 1 minute
Timezone offset UTC12
Site ID 73061.12825
Category 10 MW to 100 MW
DNI peaks at 1,000.0 W/m^2
Ocular transmission coefficient 0.5
Pupil diameter 0.002 m
Eye focal length 0.017 m
Sun subtended angle 9.3 mrad
Methodology V2

Summary of Results

Glare with potential for temporary after-image predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
PV rotated	20.0	320.0	0	0.0	13,726	228.8	-

Total annual glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
RT01 Wylie Rd	0	0.0	3,257	54.3
RT02 NZ State Hwy 1	0	0.0	0	0.0
RT02 NZ State Hwy 1 truck	0	0.0	0	0.0
RT03 Victoria St to Bergin Rd	0	0.0	0	0.0
RT04 Foxton Racecourse	0	0.0	0	0.0
RT05 Runway access driveway	0	0.0	0	0.0
FP1 Western approach	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
FP2 Eastern approach	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	2,723	45.4
OP 7	0	0.0	2,762	46.0
OP 8	0	0.0	2,623	43.7
OP 9	0	0.0	2,361	39.4
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0

Component Data

PV Arrays

Name: PV rotated
Axis tracking: Fixed (no rotation)
Tilt: 20.0°
Orientation: 320.0°
Rated power: -
Panel material: Smooth glass with AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-40.457261	175.268067	15.76	1.48	17.24
2	-40.456775	175.268479	17.00	1.48	18.48
3	-40.456754	175.268749	17.00	1.48	18.48
4	-40.457542	175.271441	11.00	1.48	12.48
5	-40.457545	175.271449	11.00	1.48	12.48
6	-40.458918	175.275737	10.00	1.48	11.48
7	-40.459695	175.275676	9.00	1.48	10.48
8	-40.459776	175.274979	10.00	1.48	11.48
9	-40.460573	175.274969	9.00	1.48	10.48
10	-40.460591	175.275578	8.98	1.48	10.46
11	-40.462322	175.274944	10.20	1.48	11.68
12	-40.461809	175.273062	6.21	1.48	7.69
13	-40.460811	175.270416	7.97	1.48	9.45
14	-40.460300	175.266733	9.39	1.48	10.87
15	-40.459557	175.266940	9.00	1.48	10.48
16	-40.459116	175.267117	9.00	1.48	10.48
17	-40.458762	175.267289	9.28	1.48	10.76
18	-40.458324	175.267480	11.00	1.48	12.48
19	-40.457907	175.267676	13.18	1.48	14.66
20	-40.457261	175.268067	15.76	1.48	17.24

Route Receptors

Name: RT01 Wylie Rd
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-40.442076	175.270367	10.00	1.50	11.50
2	-40.450250	175.264578	16.00	1.50	17.50
3	-40.456008	175.260566	15.32	1.50	16.82
4	-40.460757	175.257483	12.99	1.50	14.49
5	-40.465402	175.255773	25.00	1.50	26.50

Name: RT02 NZ State Hwy 1
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-40.454093	175.293584	21.00	1.50	22.50
2	-40.461808	175.290949	11.44	1.50	12.94
3	-40.463390	175.290224	10.00	1.50	11.50
4	-40.464838	175.288981	10.00	1.50	11.50
5	-40.467499	175.287611	9.00	1.50	10.50

Name: RT02 NZ State Hwy 1 truck
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-40.454093	175.293584	21.00	2.50	23.50
2	-40.461808	175.290949	11.44	2.50	13.94
3	-40.463390	175.290224	10.00	2.50	12.50
4	-40.464838	175.288981	10.00	2.50	12.50
5	-40.467499	175.287611	9.00	2.50	11.50

Name: RT03 Victoria St to Bergin Rd
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-40.464766	175.289027	10.00	1.50	11.50
2	-40.464671	175.288678	9.00	1.50	10.50
3	-40.464854	175.284557	9.00	1.50	10.50
4	-40.464935	175.284357	9.00	1.50	10.50
5	-40.463233	175.280482	6.80	1.50	8.30
6	-40.458320	175.281730	12.00	1.50	13.50
7	-40.457490	175.281590	15.57	1.50	17.07
8	-40.457269	175.281447	16.55	1.50	18.05
9	-40.457185	175.281270	16.38	1.50	17.88
10	-40.456687	175.279302	9.34	1.50	10.84
11	-40.456581	175.279069	9.68	1.50	11.18
12	-40.456265	175.278760	9.86	1.50	11.36
13	-40.455929	175.278189	8.23	1.50	9.73

Name: RT04 Foxton Racecourse
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-40.461742	175.290926	11.72	1.50	13.22
2	-40.461635	175.290556	11.00	1.50	12.50
3	-40.460613	175.287934	11.73	1.50	13.23
4	-40.459984	175.286276	13.00	1.50	14.50
5	-40.459759	175.285485	12.00	1.50	13.50
6	-40.459542	175.284683	12.00	1.50	13.50
7	-40.459523	175.284086	11.00	1.50	12.50
8	-40.459573	175.283370	10.00	1.50	11.50
9	-40.459692	175.282883	9.00	1.50	10.50
10	-40.459917	175.282525	9.00	1.50	10.50
11	-40.460143	175.282262	9.00	1.50	10.50
12	-40.460252	175.281942	9.00	1.50	10.50
13	-40.460360	175.281239	9.36	1.50	10.86

Name: RT05 Runway access driveway
Path type: Two-way
Observer view angle: 50.0°

Vertex	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
1	-40.461582	175.280885	7.62	1.50	9.12
2	-40.461439	175.280438	9.81	1.50	11.31
3	-40.461338	175.279748	10.00	1.50	11.50
4	-40.460262	175.276082	9.00	1.50	10.50
5	-40.460190	175.275942	9.00	1.50	10.50
6	-40.460101	175.275905	9.00	1.50	10.50
7	-40.460018	175.275902	9.00	1.50	10.50
8	-40.459875	175.275957	9.00	1.50	10.50
9	-40.458759	175.276505	10.00	1.50	11.50
10	-40.458125	175.276879	10.34	1.50	11.84
11	-40.457748	175.277057	10.00	1.50	11.50
12	-40.457596	175.277041	10.00	1.50	11.50
13	-40.457470	175.276913	10.00	1.50	11.50
14	-40.457385	175.276694	10.00	1.50	11.50
15	-40.455101	175.269350	17.00	1.50	18.50

Flight Path Receptors

Name: FP1 Western approach
Description: None
Threshold height: 15 m
Direction: 290.0°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°

Point	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
Threshold	-40.455260	175.265362	20.00	15.00	35.00
Two-mile	-40.448579	175.242958	13.00	120.00	133.00

Name: FP2 Eastern approach
Description: None
Threshold height: 15 m
Direction: 110.0°
Glide slope: 3.0°
Pilot view restricted? Yes
Vertical view: 30.0°
Azimuthal view: 50.0°

Point	Latitude (°)	Longitude (°)	Ground elevation (m)	Height above ground (m)	Total elevation (m)
Threshold	-40.458598	175.276514	10.00	15.00	25.00
Two-mile	-40.464946	175.299130	14.00	120.00	134.00

Discrete Observation Point Receptors

Name	ID	Latitude (°)	Longitude (°)	Elevation (m)	Height (m)
OP 1	1	-40.458010	175.277321	10.00	1.65
OP 2	2	-40.456921	175.273297	12.99	1.65
OP 3	3	-40.456455	175.271692	14.00	1.65
OP 4	4	-40.451539	175.267367	16.00	1.65
OP 5	5	-40.449015	175.268166	14.00	1.65
OP 6	6	-40.459164	175.259353	9.00	1.65
OP 7	7	-40.460395	175.256987	11.94	1.65
OP 8	8	-40.460845	175.256762	10.28	1.65
OP 9	9	-40.460151	175.255274	10.00	1.65
OP 10	10	-40.460046	175.292971	17.00	1.65
OP 11	11	-40.459201	175.292319	18.00	1.65
OP 12	12	-40.459397	175.294832	20.00	1.65
OP 13	13	-40.457648	175.294175	20.00	1.65
OP 14	14	-40.457831	175.281147	12.00	1.65
OP 15	15	-40.457462	175.280658	9.83	1.65
OP 16	16	-40.456761	175.277768	9.00	1.65
OP 17	17	-40.455363	175.278211	9.00	1.65
OP 18	18	-40.455717	175.279693	19.30	1.65
OP 19	19	-40.457609	175.282035	16.68	1.65

Glare Analysis Results

Summary of Results

Glare with potential for temporary after-image predicted

PV Array	Tilt	Orient	Annual Green Glare		Annual Yellow Glare		Energy
	°	°	min	hr	min	hr	kWh
PV rotated	20.0	320.0	0	0.0	13,726	228.8	-

Total annual glare received by each receptor; may include duplicate times of glare from multiple reflective surfaces.

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
RT01 Wylie Rd	0	0.0	3,257	54.3
RT02 NZ State Hwy 1	0	0.0	0	0.0
RT02 NZ State Hwy 1 truck	0	0.0	0	0.0
RT03 Victoria St to Bergin Rd	0	0.0	0	0.0
RT04 Foxton Racecourse	0	0.0	0	0.0
RT05 Runway access driveway	0	0.0	0	0.0
FP1 Western approach	0	0.0	0	0.0
FP2 Eastern approach	0	0.0	0	0.0
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 6	0	0.0	2,723	45.4
OP 7	0	0.0	2,762	46.0
OP 8	0	0.0	2,623	43.7
OP 9	0	0.0	2,361	39.4
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0

Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
OP 19	0	0.0	0	0.0

PV: PV rotated potential temporary after-image

Receptor results ordered by category of glare

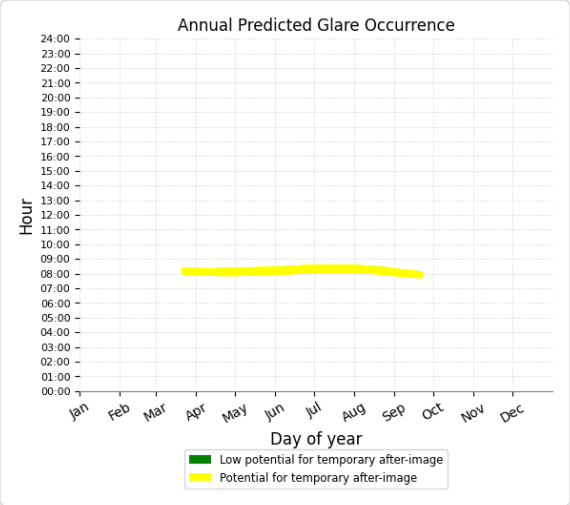
Receptor	Annual Green Glare		Annual Yellow Glare	
	min	hr	min	hr
RT01 Wylie Rd	0	0.0	3,257	54.3
RT02 NZ State Hwy 1	0	0.0	0	0.0
RT02 NZ State Hwy 1 truck	0	0.0	0	0.0
RT03 Victoria St to Bergin Rd	0	0.0	0	0.0
RT04 Foxton Racecourse	0	0.0	0	0.0
RT05 Runway access driveway	0	0.0	0	0.0
FP1 Western approach	0	0.0	0	0.0
FP2 Eastern approach	0	0.0	0	0.0
OP 6	0	0.0	2,723	45.4
OP 7	0	0.0	2,762	46.0
OP 8	0	0.0	2,623	43.7
OP 9	0	0.0	2,361	39.4
OP 1	0	0.0	0	0.0
OP 2	0	0.0	0	0.0
OP 3	0	0.0	0	0.0
OP 4	0	0.0	0	0.0
OP 5	0	0.0	0	0.0
OP 10	0	0.0	0	0.0
OP 11	0	0.0	0	0.0
OP 12	0	0.0	0	0.0
OP 13	0	0.0	0	0.0
OP 14	0	0.0	0	0.0
OP 15	0	0.0	0	0.0
OP 16	0	0.0	0	0.0
OP 17	0	0.0	0	0.0
OP 18	0	0.0	0	0.0
OP 19	0	0.0	0	0.0

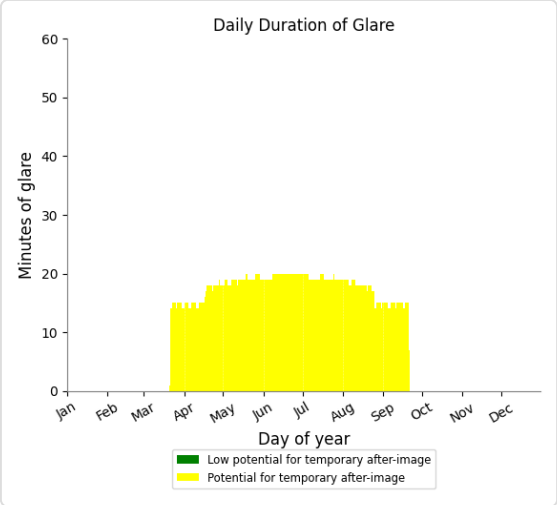
PV rotated and RT01 Wylie Rd

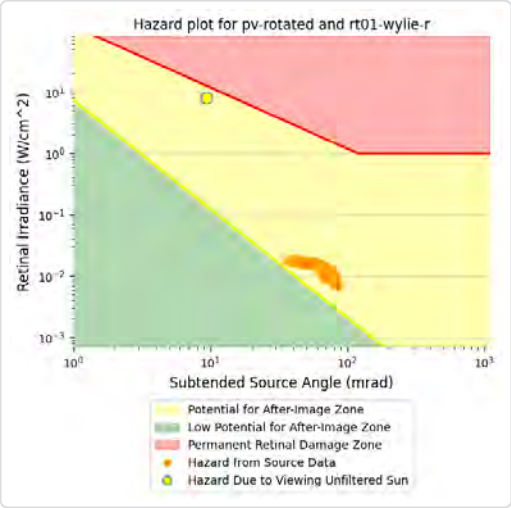
Receptor type: Route

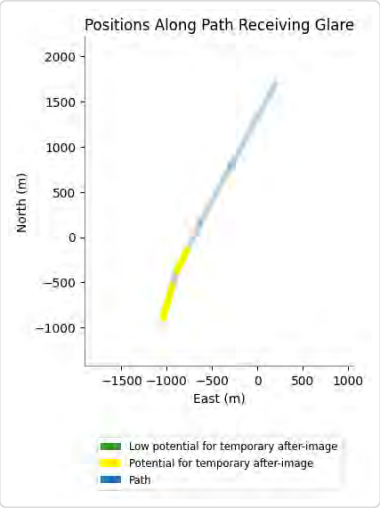
3,257 minutes of yellow glare

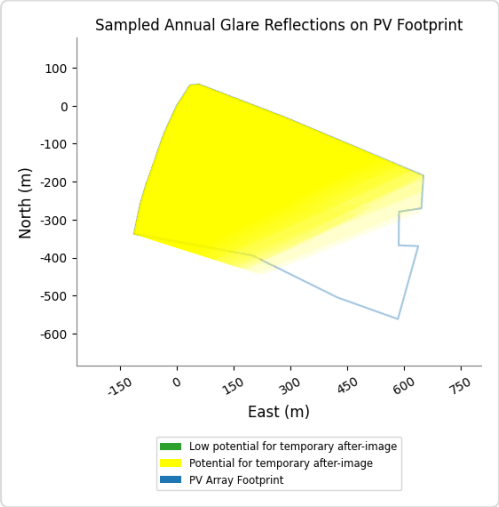
0 minutes of green glare











PV rotated and RT02 NZ State Hwy 1

Receptor type: Route
No glare found

PV rotated and RT02 NZ State Hwy 1 truck

Receptor type: Route
No glare found

PV rotated and RT03 Victoria St to Bergin Rd

Receptor type: Route
No glare found

PV rotated and RT04 Foxton Racecourse

Receptor type: Route
No glare found

PV rotated and RT05 Runway access driveway

Receptor type: Route
No glare found

PV rotated and FP1 Western approach

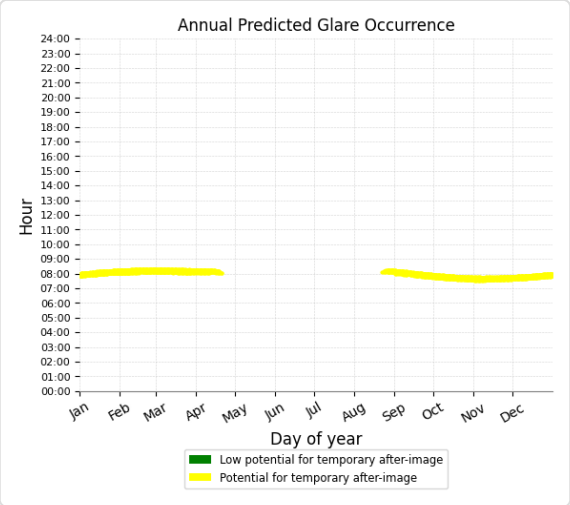
Receptor type: 2-mile Flight Path
No glare found

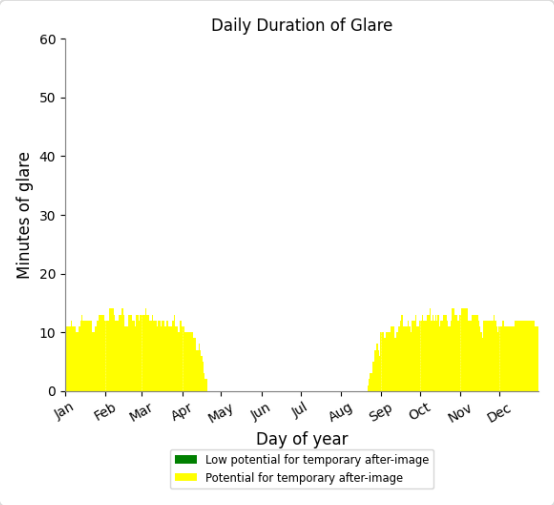
PV rotated and FP2 Eastern approach

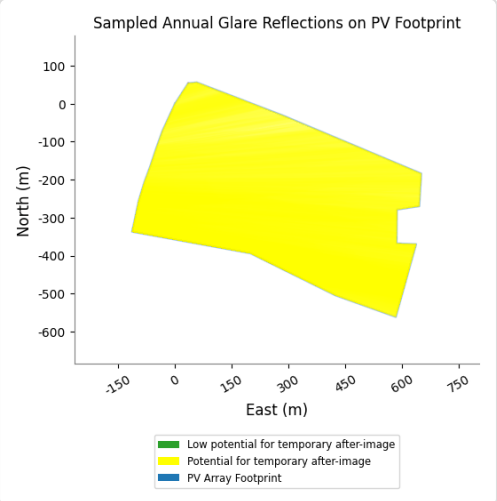
Receptor type: 2-mile Flight Path
No glare found

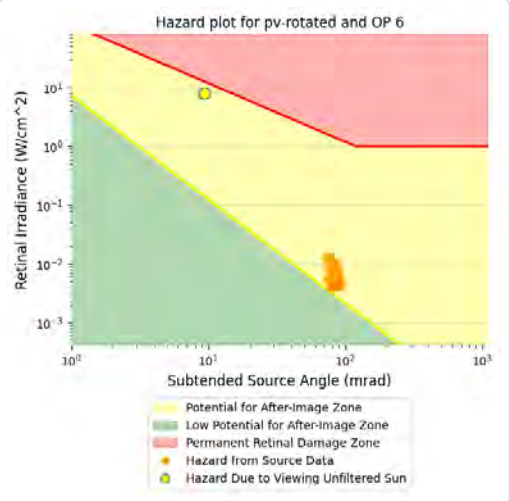
PV rotated and OP 6

Receptor type: Observation Point
2,723 minutes of yellow glare
0 minutes of green glare



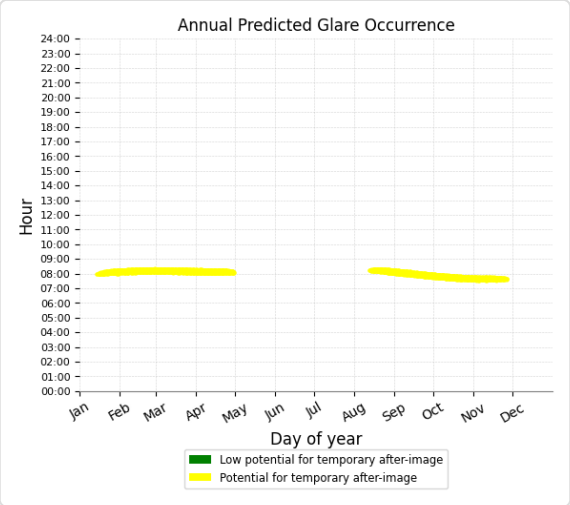


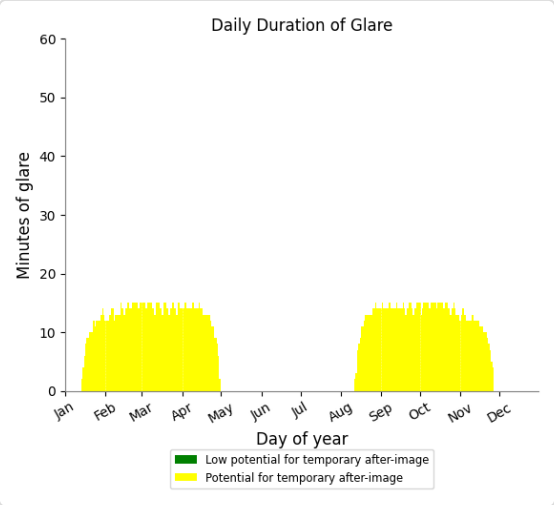


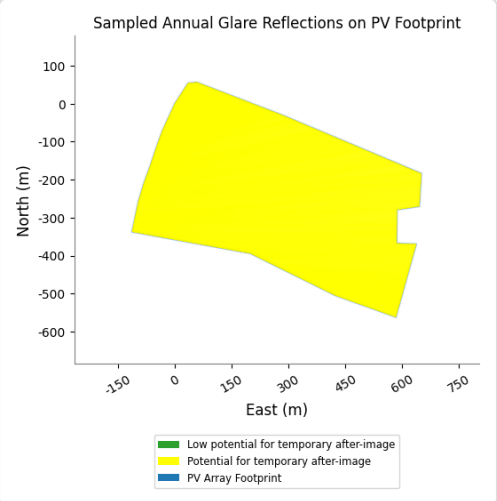


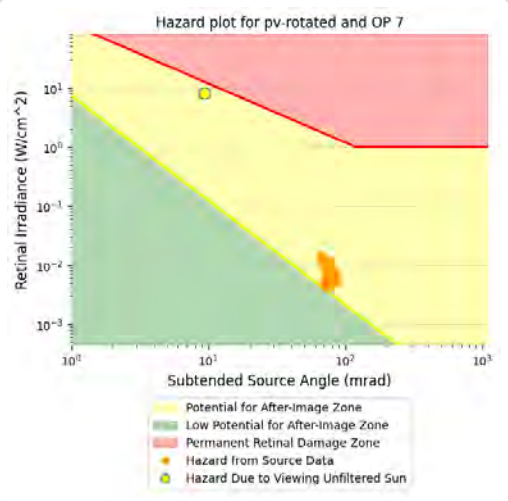
PV rotated and OP 7

Receptor type: Observation Point
2,762 minutes of yellow glare
0 minutes of green glare



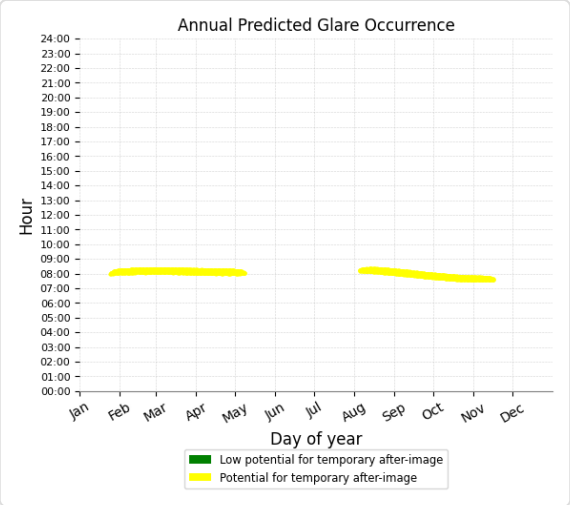


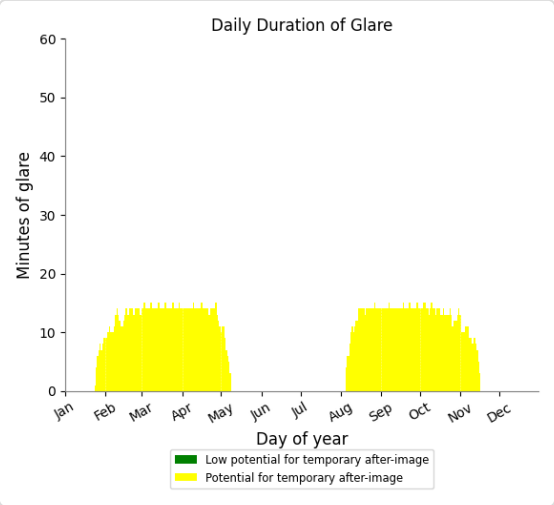


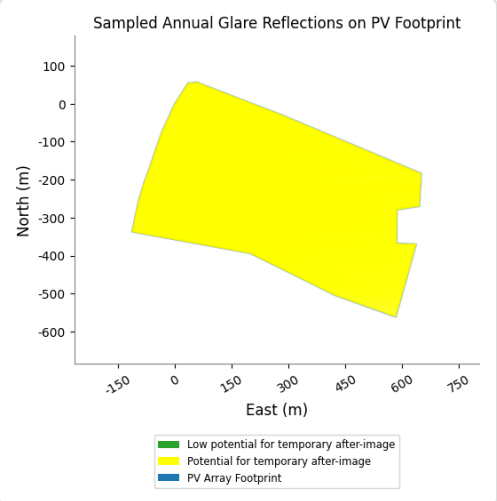


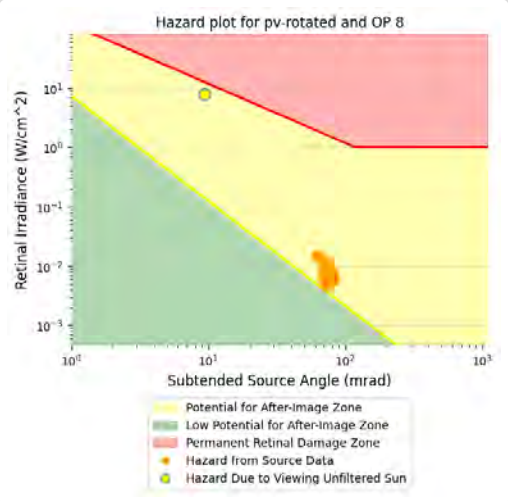
PV rotated and OP 8

Receptor type: Observation Point
2,623 minutes of yellow glare
0 minutes of green glare



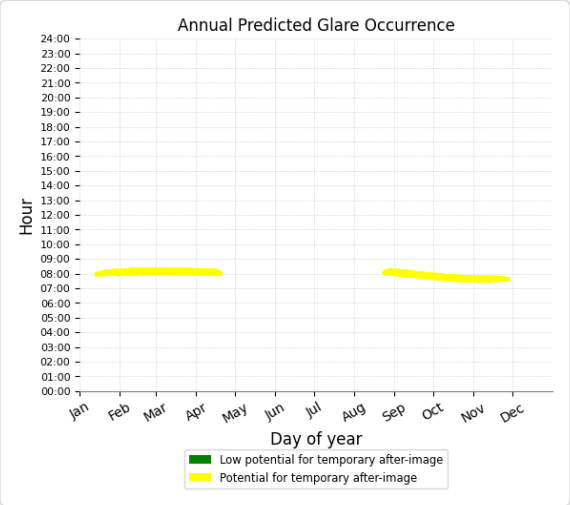


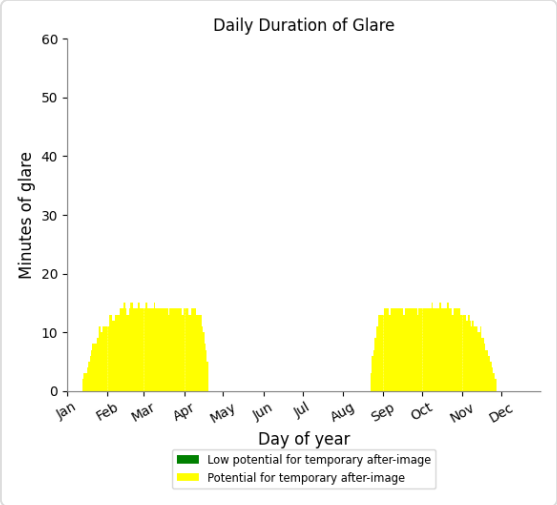


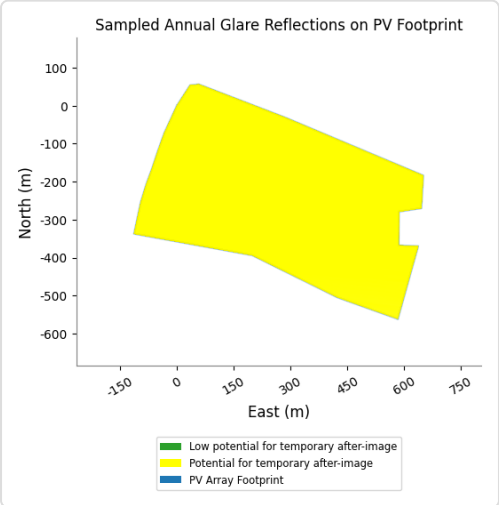


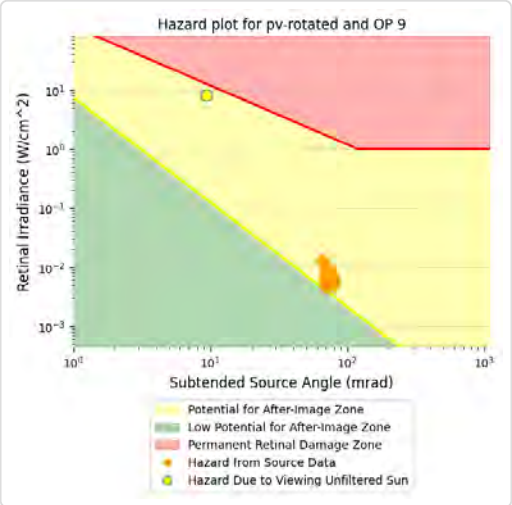
PV rotated and OP 9

Receptor type: Observation Point
2,361 minutes of yellow glare
0 minutes of green glare









PV rotated and OP 1

Receptor type: Observation Point
No glare found

PV rotated and OP 2

Receptor type: Observation Point
No glare found

PV rotated and OP 3

Receptor type: Observation Point
No glare found

PV rotated and OP 4

Receptor type: Observation Point
No glare found

PV rotated and OP 5

Receptor type: Observation Point
No glare found

PV rotated and OP 10

Receptor type: Observation Point
No glare found

PV rotated and OP 11

Receptor type: Observation Point
No glare found

PV rotated and OP 12

Receptor type: Observation Point
No glare found

PV rotated and OP 13

Receptor type: Observation Point
No glare found

PV rotated and OP 14

Receptor type: Observation Point
No glare found

PV rotated and OP 15

Receptor type: Observation Point
No glare found

PV rotated and OP 16

Receptor type: Observation Point
No glare found

PV rotated and OP 17

Receptor type: Observation Point
No glare found

PV rotated and OP 18

Receptor type: Observation Point
No glare found

PV rotated and OP 19

Receptor type: Observation Point
No glare found

Assumptions

"Green" glare is glare with low potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
"Yellow" glare is glare with potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
The algorithm does not rigorously represent the detailed geometry of a system; detailed features such as gaps between modules, variable height of the PV array, and support structures may impact actual glare results. However, we have validated our models against several systems, including a PV array causing glare to the air-traffic control tower at Manchester-Boston Regional Airport and several sites in Albuquerque, and the tool accurately predicted the occurrence and intensity of glare at different times and days of the year.
Several V1 calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare. This primarily affects V1 analyses of path receptors.
Random number computations are utilized by various steps of the annual hazard analysis algorithm. Predicted minutes of glare can vary between runs as a result. This limitation primarily affects analyses of Observation Point receptors, including ATCTs. Note that the SGHAT/ ForgeSolar methodology has always relied on an analytical, qualitative approach to accurately determine the overall hazard (i.e. green vs. yellow) of expected glare on an annual basis.
The analysis does not consider obstacles (either man-made or natural) between the observation points and the prescribed solar installation that may obstruct observed glare, such as trees, hills, buildings, etc.
The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)
The variable direct normal irradiance (DNI) feature (if selected) scales the user-prescribed peak DNI using a typical clear-day irradiance profile. This profile has a lower DNI in the mornings and evenings and a maximum at solar noon. The scaling uses a clear-day irradiance profile based on a normalized time relative to sunrise, solar noon, and sunset, which are prescribed by a sun-position algorithm and the latitude and longitude obtained from Google maps. The actual DNI on any given day can be affected by cloud cover, atmospheric attenuation, and other environmental factors.
The ocular hazard predicted by the tool depends on a number of environmental, optical, and human factors, which can be uncertain. We provide input fields and typical ranges of values for these factors so that the user can vary these parameters to see if they have an impact on the results. The speed of SGHAT allows expedited sensitivity and parametric analyses.
The system output calculation is a DNI-based approximation that assumes clear, sunny skies year-round. It should not be used in place of more rigorous modeling methods.
Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid based on aggregated research data. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
Refer to the Help page at **www.forgesolar.com/help/** for assumptions and limitations not listed here.

Default glare analysis parameters and observer eye characteristics (for reference only):

- Analysis time interval: 1 minute
- Ocular transmission coefficient: 0.5
- Pupil diameter: 0.002 meters
- Eye focal length: 0.017 meters
- Sun subtended angle: 9.3 milliradians

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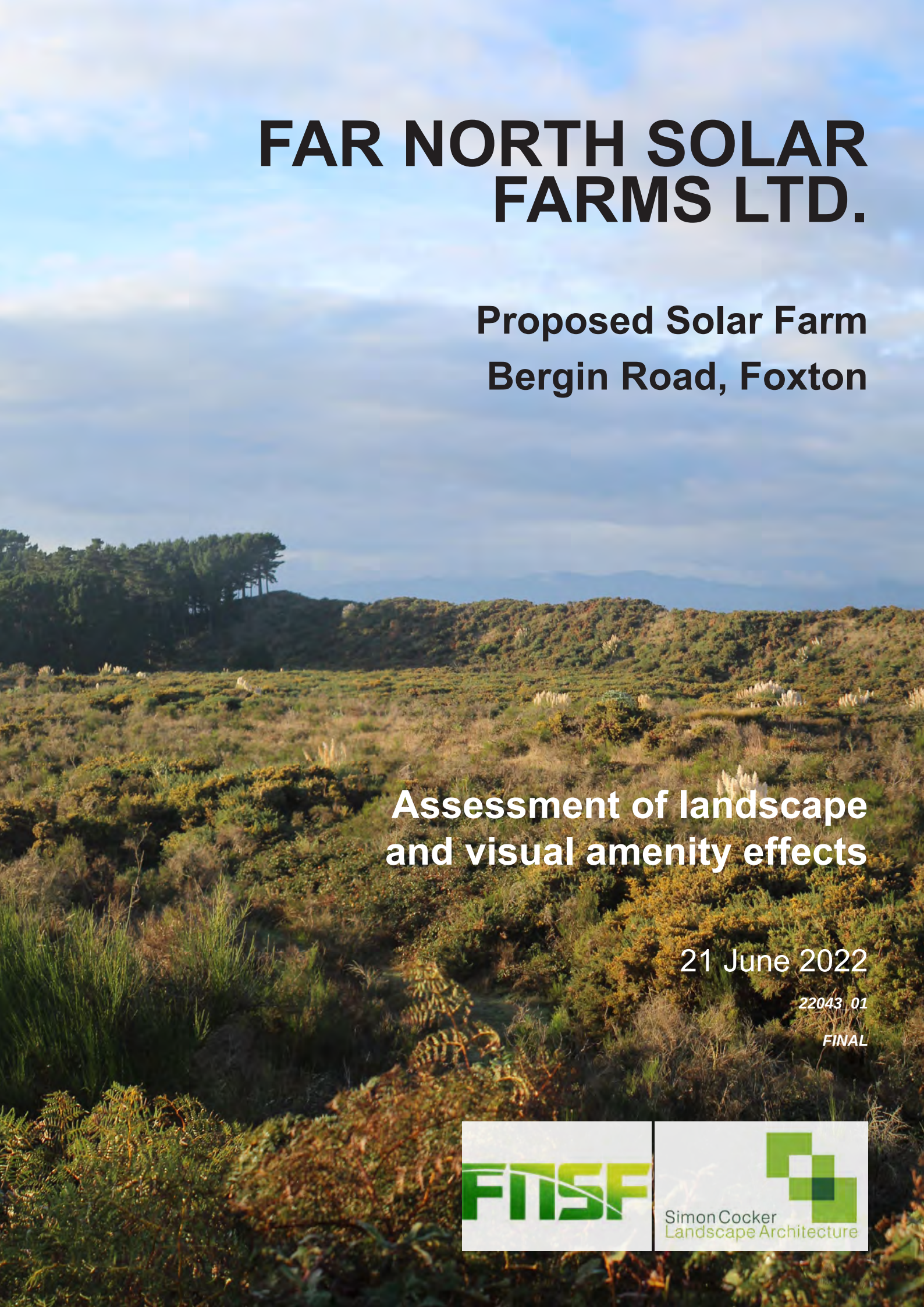

FAR NORTH SOLAR FARMS LTD.

Proposed Solar Farm
Bergin Road, Foxton

Assessment of landscape and visual amenity effects

21 June 2022

22043_01

FINAL

FNSF

Simon Cocker
Landscape Architecture

Simon Cocker
Landscape Architecture

Document Quality Assurance

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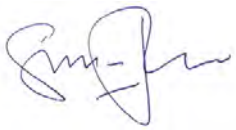
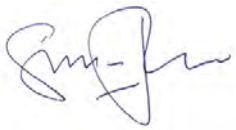
Prepared by	Simon Cocker Landscape Architect Principal SCLA	
Reviewed by	Simon Cocker Landscape Architect Principal SCLA	
Ref.	22043_01	
Status: FINAL	Revision / version 1	Issue Date: 21 June 2022

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TABLE OF CONTENTS

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1.0 INTRODUCTION

Simon Cocker Landscape Architecture has been engaged by Far North Solar Farms Ltd. to undertake a landscape, and visual amenity assessment for a photovoltaic solar farm next to Foxpine Airpark, Bergin Road, Foxton, 4814 (refer to Figure 1). The site has access to a substation at Union Street, which is 2.7km away in terms of cabling routes.

This document will focus upon a description of the site, the characteristics of the proposal and an analysis of the landscape, identification of any affected parties or individuals, an assessment of the landscape, and visual amenity effects of the activity.

Specific to the type of activity under consideration, reference has also been made to the BRE planning guidance publication[1] which includes guidance for the assessment of landscape and visual effects associated with ground mounted solar PV systems.

The site is located within the Rural Zone. It is understood that the activity status of the application is Discretionary.

2.0 ASSESSMENT METHODOLOGY

The assessment has been prepared by a Registered Landscape Architect with reference to the Te Tangi A Te Manu (Aotearoa New Zealand Landscape Guidelines). The assessment methodology is detailed in Appendix 2. In addition, this report has been prepared in accordance with the NZILA (New Zealand Institute of Landscape Architects) Code of Conduct[2].

Effects Ratings and Definitions

The significance of effects identified in this assessment are based on a seven-point scale which includes negligible, very low; low; moderate-low; moderate, high, and very high.

Desktop study and site visits

In conducting this assessment, a desktop study was completed which included a review of the relevant information relating to the landscape and visual aspects of the project. This information included:

- Northland Regional Policy Statement (2016);
- The Far North District Plan;
- Site plan prepared by Aquila Capital titled 'Ganesis – Foxton – 39.5MWp New Zealand' Rev 5, dated 16/05 /2022;
- Earthworks plans prepared by FNSL dated 5/6/22;
- Drone survey plan prepared by Recon, dated 27/04/2022
- AEE prepared by The Catalyst Group Ltd., dated 12 April 2022;
- Boffa Miskell Ltd. Outstanding Natural Landscape and Features Review, dated August 2011;
- Aerial photography, Kaipara District Council GIS mapping, and Google Earth.

[1] BRE Trust. *Planning guidance for the development of large scale ground mounted solar PV systems*. October 2013
[2] Contained in Appendix 1 of: http://www.nzila.co.nz/media/50906/registered_membership_guide_final.pdf

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A visit was undertaken on the morning of 24 April 2022. The weather conditions during the visit were sunny with light winds.

2.0 THE PROPOSAL

Far North Solar Farm Ltd seeks consent to construct a photovoltaic solar farm within the subject site. The proposal is illustrated in Figures 2 and 3. The site cis described as Lot 3-4 DP 27011 and Lot 7 DP 68629. The Site covers a total area of 39.6ha, with 33.36ha occupied by the solar arrays.

Site Preparation / Earthworks

The existing dune ridge which is aligned along the southern boundary of the Site will be retained. The balance of the Site will be recontoured to create a flat surface for construction of the farm.

The total area of earthworks will be 28.44ha, with a cut volume of 207,424.70m^3, and a fill volume of 152,024.29m^3.

In total the site will contain 8 Inverter Stations (MVPS) and 72,464 solar panels. Each inverter station will consist of 372 arrays of 128 panels and 72 arrays of 64 panels for a total of 102 combiner boxes. An MV Room, will be contained within a shed which will be located at the entrance to the Site on Bergin Road. This building will be 9.0m x 14.0m x 3.6m tall, and clad with corrugated zinc cladding. The building will have a GFA of 126.0m^2 (refer to Plate 1 below).

Plate 1. Example image of proposed shed housing MV Room

The panels will be fixed to mounting legs which will be secured to concrete foundations placed over the topsoil. The legs for the mounts will be secured to the foundations. The panels will be fixed with a tilt at 20 degrees facing north with a maximum height of 2.55m (refer to Plates 2 and 3 below).

Into each solar mounting structure two modules of 545Wp are vertically mounted with 28 modules per string tables. The gap between two tables will be 6.7m. As such, the panel spans will appear more 'fragmented', with a greater proportion of 'space' to 'structure'.

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Plate 2. Example image of proposed fixed panels

Plate 3. Example image of proposed fixed panels

The total generation capacity of the of each inverter block will be 26.4 or 30.8 MW. An individual inverter block is rated at 4.4 MVA . The total solar capacity for the farm therefore equates to 31.334MWp using a 600-Watt panel. The site will also consist of an office, connection point and storage area to the East of the farm.

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There has been no earthworks or physical modification of the site undertaken by the applicant prior to consents being lodged. Vegetation clearance and earthworks will be required to provide a contour suitable for installation of the solar arrays.

Figure 2a illustrates how the applicant intends to retain the existing ridge landform along the southern edge of the Site, (and the existing vegetation growing on the ridge), and the ridge landform which projects into the Site on its western edge (refer to Figure 2a). Retention of these features will ensure that the Site will be screened from the landscape to the south and south west.

The timing of the development is orientated around disturbance and stabilisation of the site (with grass cover and planting) through the Spring period with infrastructure installation through the Summer period 2022/23. This activity will have no more than minor effects beyond the boundary with respect to impacts on the whenua.

The site will be enclosed by a 2.1m security fence. It will be constructed from wire mesh, with galvanized steel posts and will be visually permeable. The posts and mesh will be left to weather to a dull grey galvanized finish.

Construction will occur over a period of 6 – 7 months.

Landscape Mitigation

Vegetation screen plantings (3.0m wide) are proposed on the western boundary, and on the eastern boundary of the Site. The proposed screen plantings will comprise locally appropriate native species, typically found in the Taranaki sand country scrubland landscapes, as detailed in the schedule below:

Species	Common name	grade	% mix	spacing
Coprosma areolata	Thin leaf coprosma	1L	5	1.4
Kunzea amathicola	rawiwitoa	0.5L	50	1.4
Leucopogon fasciculatus	mingimingi	1L	10	1.4
Phormium tenax	harakeke	1L	20	1.4
Pseudopanax crassifolius	horoeka	1L	10	1.4

Table 1. Screen planting plant schedule

The screen plantings will be maintained to a maximum height of 3.0m to ensure that they do not interfere with the solar gain to the panels.

The ground surface below and between the racks of solar arrays will be maintained in grass, and either mown occasionally or be grazed by sheep.

Operational activities

The Site will be accessed via a crossing off Bergin Road. The crossing will be constructed from concrete, and accessways within the Site will be constructed from metal. The site will not be lit.

It is anticipated that the site will generate very little traffic – this being occasional (quarterly) visits by the facility maintenance contractor, and monthly visits from the landscape / mowing contractor (during the faster growing periods of the spring and autumn, and less frequently during winter and summer).

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3.0 EXISTING ENVIRONMENT

3.1 The site context and character

Figure 1 illustrates the location of the Site. It is situated to the north west of the Foxton settlement and abuts the airfield on its southern edge. On its eastern edge, it adjoins an industrial area and is accessed via a metal track which also serves the airfield (refer to photo 1).

Geologically, the subject Site is underlain by Holocene windblow deposits – identified as OIS1 (Holocene stable dune deposits – and occupies a location within a wider remnant dune field landscape of some 100 square kilometres in area. This dune field, located to the west of the Manawatu River, and adjacent to the northern boundary of the Horowhenua District has its western boundary approximately 3km inland from the coast.

The landscape is characterised by a low lying and subtly undulating landform with an extensive series of dunes aligned perpendicular to the coastline (refer to photo 2). The dune lands were formed by coastal processes of wind deposited sands brought inland by the prevailing north-westerly on-shore winds. Consequently, the dunes lie parallel to the wind direction, resulting in a repeating sequence of lines of dunes separated by flatter low lying land. This west – east 'grain' is embedded in the landscape where – as can be seen from Figure 1 – a similar 'grain' displayed in the vegetative and land use patterns.

The dune landforms are still very evident and in places their form is accentuated by the different vegetation cover such as where production woodlots are established on the dunes and the flatter land between the dunes is grazed. Largely, the dunes appear to be intact, however the inter-dunal hollows and sandflats have been modified over time as a result of development, cultivation and grazing practices.

Whilst the Site occupies a peri-urban location, the predominant land use of the rural area is grazed pasture for dairy and beef production with pockets of horticulture. Production forest plantations, woodlots and shelterbelts (typically radiata pine) are also a common land use, with several plantations over 50ha.

Vegetation of the farmed land is almost exclusively exotic species, including improved grasses, greenfeed crops, and productive tree species. There is very little indigenous vegetation present; where it does occur the patches are small and scattered. Several reserves protect areas of indigenous vegetation and habitat, but with the exception of Round Bush Reserve, Himatangi Bush Scientific Reserve and Davis Bush, the other areas of indigenous vegetation are very small and fragmented.

The predominant character of the area to the west is a productive working rural landscape. While the sequences of parallel dunes are a characterising element of the landscape, the overlay of human induced modification is dominant with buildings, fences powerlines, farm tracks, farming operations – and to the north of the subject Site – the airfield (refer to photos 3 and 4). In addition, individual scattered dwellings, and pockets of subdivision are evident including, accessed by Bergin Road and Maury Place, a cluster of settlement within lots of some 4,000m^2 located a minimum of some 250m to the north east of, but separated from the Site by the airfield.

To the east, the Site adjoins an industrial area which is characterised by a somewhat derelict appearance. Beyond this, some 400 – 500m to the south east is Manawatu College and the Foxton commercial centre.

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Beyond the edge of the urban area the dune landforms tend to be retained as intact landforms. Where this is the case, some of the larger dunes are visually striking when viewed at close quarters, but many of the dunes are masked by vegetation. While farmed animals, pasture and pine trees can be considered natural elements, the overall naturalness in relation to 'indigenous natural' is considered to be low.

Within the Site and through the wider area, the indigenous biodiversity is very low due as a result of the production farming systems throughout the area. The Site has been extensively modified over many decades and is primarily under dense exotic weeds including gorse, blackberry, and pampas (refer to photos 5, 6, 7, and 8). Some sand kanuka is evident.

On its eastern edge, the Site is separated from the industrial area by a stand of mature pine trees (refer to photo 9).

It is understood that the Site has, in the past, been subject to earthworks, and contains, waste ground cover which has been derived from the development of the adjacent airpark has been stockpiled on site.

The site is periodically used by the community for access to the adjacent Foxton loop, and is accessible via an informal loop track which appears to be used by individuals riding horses and dirt bikes.

The wider landscape – underpinned by the dunefields which are a valued feature of the Foxton area – contributes to the identity of the Horowhenua District. Historically, the Foxton area was the hub of the flax export industry, and therefore the area has historic and heritage values associated with that activity.

This area, like much of the Horowhenua has high cultural values for tangata whenua, and the area accommodates two Ngati Raukawa marae.

3.2 Statutory Matters

Horowhenua District Plan

The Site is situated within the Rural zone, and the Foxton Dunelands Domain, and adjoins an area zoned Industrial zone on its eastern edge.

To the Southeast, an area zoned Residential is separated from the Site approximately 20m in distance from the site (refer to Plate 1 below). There are no overlays on the site or significant heritage features. There is a moa hunter midden to the East of the site. The rural zone supports a number of primary production processes and is subject to varying land uses. As well as primary production, there is the requirement for these areas to provides for industries and utilities.

The area of the proposal falls within the coastal landscape of the Horowhenua District, being segregated from the rural plains setting by the Manawatu River which encloses the town of Foxton and Foxton Beach.

The objectives and policies of relevance are as follows"

Objective 2.4.1: Land Use Activities – Nature, Character, Amenity Values and Servicing To enable primary production activities and other rural based land uses to function efficiently and effectively in the Rural Zone, while avoiding,

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remedying, or mitigating the adverse effects of activities, including reverse sensitivity effects caused by new activities on existing activities, in a way that maintains and enhances the character and amenity values of the rural environment.

Policy 2.4.5: Manage any activity which does not meet minimum standards by assessing on a case-by case basis to ensure the adverse effects on the environment are avoided, remedied, or mitigated.

Policy 2.4.7: Avoid, remedy, or mitigate the impact of buildings on the rural landscape and maintain overall low building density and building height throughout the rural environment.

Policy 2.4.10: Avoid, remedy, or mitigate adverse effects on rural privacy and rural character in the Rural Zone by maintaining road and site boundary setbacks for all buildings, while recognising the degree of privacy and rural spaciousness is different in areas comprising existing smaller rural-residential lots.

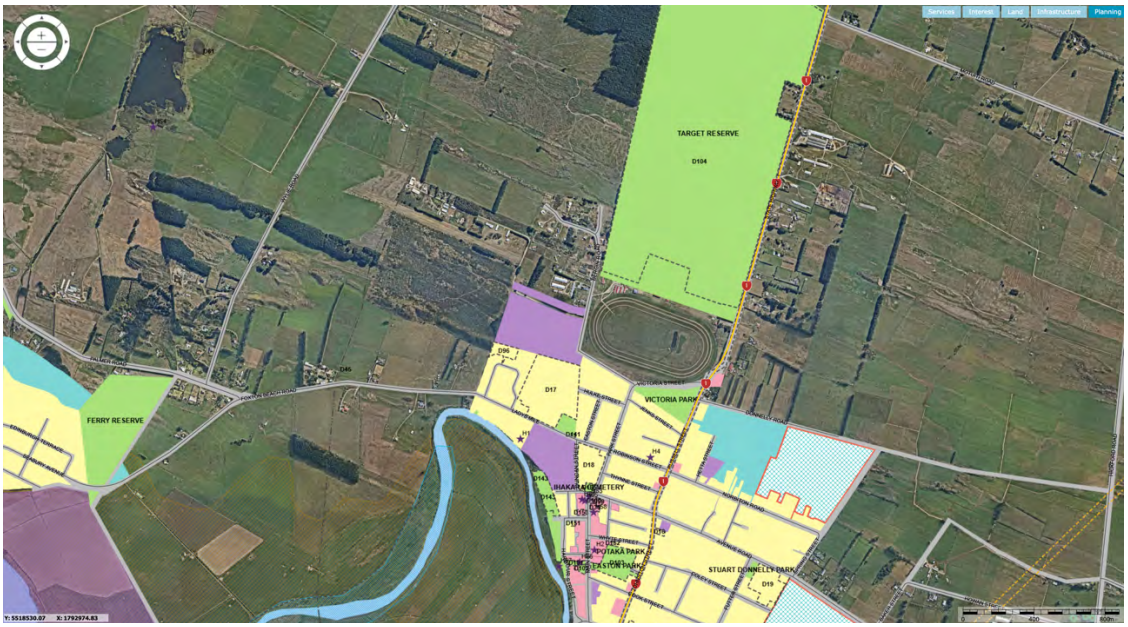

Plate 1: Zoning

Objective 2.4.1: Land Use Activities – Nature, Character, Amenity Values and Servicing To enable primary production activities and other rural based land uses to function efficiently and effectively in the Rural Zone, while avoiding, remedying, or mitigating the adverse effects of activities, including reverse sensitivity effects caused by new activities on existing activities, in a way that maintains and enhances the character and amenity values of the rural environment.

Policy 2.4.5: Manage any activity which does not meet minimum standards by assessing on a case-by case basis to ensure the adverse effects on the environment are avoided, remedied, or mitigated.

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Policy 2.4.13: Avoid, remedy, or mitigate any adverse effects upon residential properties or road safety caused by lighting or glare from any source.

Policy 2.4.19: Provide for a limited amount of signage located on the site to which the activity relates to minimise the effects on the rural environment.

Policy 12.2.4: Manage the establishment and development of new renewable electricity generation facilities to ensure the adverse environmental effects that are more than minor are avoided, remedied, or mitigated.

Policy 12.2.6: Avoid, remedy, or mitigate adverse effects on the environment from renewable electricity generation and distribution activities, specifically on those parts of the environment most sensitive to change.

Policy 12.2.7: Manage effects of renewable electricity generation by: (a) avoiding significant adverse cumulative effects on the characteristics and values of Outstanding Natural Features and Landscapes; and (b) avoiding any other adverse effects of renewable electricity generation facilities on the characteristics and values of Outstanding Natural Features and Landscapes. Where avoidance is not reasonably practical, adverse effects need to be remedies or mitigated.

Policy 12.2.8: Ensure development of renewable electricity generation facilities minimises visual interruption or intrusion of views of the Tararua Ranges when viewed from public spaces within the Levin urban area

The Horowhenua District Plan has regard to Section 7 of the RMA which specifies the Councils must have particular regard to energy efficiency, climate, and the benefits of renewable energy. Under the NPS for renewable energy generation, the development of renewable energy facilities must be provided for as a matter of national significance. This proposal aligns with Policies 12.2.1, 12.2.4,12.2.5, 12.2.6, 12.2.7, 12.2.8, 12.2.9, 12.2.10 under Objective 12.2.1 of The District Plan for Energy..

The full policy framework is set out in the Assessment of Environmental Effects.

19.6.13 Earthworks-Specific Landscape Domains

(iii) Foxton Dunefields Landscape Domain

- 3 metres (cut or fill) measured vertically
- Where earthworks exceed 3 metres (cut or fill) measured vertically, those earthworks shall not exceed 5 metres (cut or fill) measured vertically and shall not exceed a distance of 50 metres in continuous horizontal length.
- Where earthworks are to be undertaken on a dune, the vertical height of the dune, or any part of that dune, prior to the earthworks shall be no greater at any point than 10 metres from toe to summit.

3.3 Visual Catchment

The majority of the Site is currently situated within a relatively constrained visual catchment, contained on its southern side by a parabolic dune of some 20m in height which extends inland from the west along the Site's southern boundary.

The proposal envisages the modification of this feature – which is visible in photo 10. Foxton Beach Road runs parallel to the Site's southern boundary, at a distance of some 400m. A number of rural residential properties containing dwellings are accessed from the northern side of this road, including Lot 1 DP 311167 (#84), Pt Lot 1 DP 59838 (#62) Lots 1, 2 and 3 DP 407861(#60, #60A and #60B), Lot 3 DP 59838 Lot 1 DP 20355 (#22), Pt Lot 4 DP 2590 (#14).

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To the south east of the Site, a cluster of residential settlement accessed from Herrington Street extends between Foxton Beach Road and the dune. Adjoining this cluster to the north, a dwelling within Pt Lot 1 DP 23277 (#13) contains a dwelling situated on the dune crest approximately 160m to the south east of the Site boundary.

This dwelling is separated from the Site by vegetation. Lot 32 DP 17402 (#25A) also occupies the dune crest, is accessed from Herrington Street and abuts the Site on its western boundary. This lot is some 1ha in area and is primarily vegetated with exotic trees. It does not contain a dwelling.

To the east, a plantation of mature pine trees contains the Site from this quadrant and separates it from the neighbouring industrial area (refer to photos 8 and 9).

Longer views are possible from the west and the north. As is evidenced by Figure 3, the terrain to the west of the Site is relatively flat, with only subtle undulations derived from dune landforms. Views are possible from Wylie Road (refer to photo 2), some 630m to the west but, with the exception of potential glimpses from Lots 1 and 2 DP 347643, residential viewers within this western quadrant are situated to the south west, or north west and landform or vegetation precludes views from these locations.

To the north, the Site adjoins the airfield. Views from the airfield are possible to the Site (refer to photos 2 and 3). Built development and vegetation within the airfield precludes views from further to the north.

Views from the north east are blocked by vegetation.

4.0 IDENTIFIED LANDSCAPE VALUES

Plate 2 below illustrates the identified geological values of the area[3]. The Manawatu River Estuary area, as depicted in Plate 2 approximates the extent of the Manawatu Estuary ONFL as identified in the District Plan.

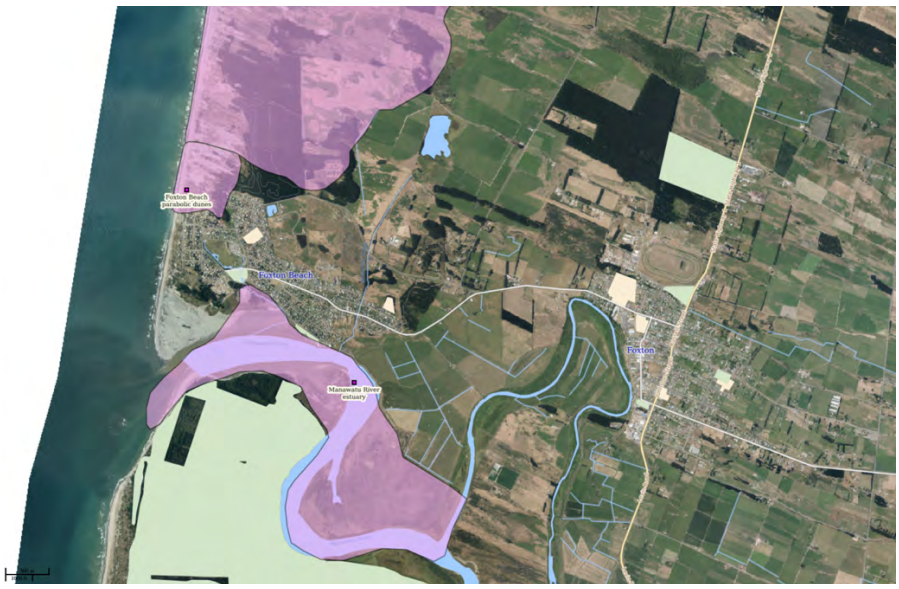

Plate 2: District Plan Overlays

[3] Source: NZ Geopreservation Inventory - https://services.main.net.nz/geopreservation/

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Also identified in the Plan is the Coastal ONFL which encompasses the coastal dune strip to the west of the subject Site. No ONFL overlay the Site.

The Outstanding Natural Landscapes and Features Review[4] reviewed the landscape values of the Foxton Dunefields and determined that the area as a whole, did not meet the threshold to justify its recognition as an outstanding natural landscape, recognising that – in places – the dunelands were substantially modified, being classified as an outstanding natural landscape.

It did conclude however, that "….*the dune landforms are an important characterising element of the Horowhenua landscape*."

Within this context, when the landscape is assessed against the attributes set out as Table 2 in Appendix 3, it is determined that the landscape quality is at most, 'Ordinary'. It displays a distinguishable landscape structure, characteristic patterns of landform and land cover often masked by landuse, together with some features worthy of conservation, and some detracting features.

5.0 ASSESSMENT OF LANDSCAPE EFFECTS

The effects covered in this assessment, include those that can occur in relation to physical features, viewing audiences and visual amenity and/or on the site's contribution to the existing landscape character and amenity values, as follows:

- Landscape effects derive from changes in the physical landscape, which may give rise to changes in its character and how this is experienced. This may in turn affect the perceived value ascribed to the landscape and includes visual amenity effects under the ambit of 'experiential attributes'.

Impacts on landscape effects can result from change in the components, character or quality of the landscape. Usually these are the result of landform or vegetation modification or the introduction of new structures, facilities or activities. All these impacts are assessed to determine their effects on landscape character and quality, rural amenity and on public and private views. In this report, the assessment of potential effects is based on a combination of the landscape's sensitivity and visibility and the nature and scale of the development proposal.

The nature of landscape and visual amenity effects generated by any particular proposal can, therefore, be:

- Positive (beneficial), contributing to the visual character and quality of the environment.
- Negative (adverse), detracting from existing character and quality of environment; or
- Neutral (benign), with essentially no effect on existing character or quality of environment.

Landscape and visual amenity effects can be rated on a seven-point scale from Very High, through to Very Low (refer to Appendix 2).

The degree to which landscape and visual amenity effects are generated by a development depends on several factors, these include:

[4] Boffa Miskell. August 2011. Outstanding Natural Landscapes and Features Review. P18.

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- The degree to which the proposal contrasts, or is consistent, with the qualities of the surrounding landscape.
- The proportion of the proposal that is visible, determined by the observer's position relative to the objects viewed.
- The distance and foreground context within which the proposal is viewed.
- The area or extent of visual catchment from which the proposal is visible.
- The number of viewers, their location and situation (static or moving) in relation to the view.
- The backdrop and context within which the proposal is viewed
- The predictable and likely known future character of the locality
- The quality of the resultant landscape, its aesthetic values and contribution to the wider landscape character to the area.

Change in a landscape does not, of itself, necessarily constitute an adverse landscape or natural character effect. Landscape is dynamic and is constantly changing over time in both subtle and more dramatic transformational ways, these changes are both natural and human induced. What is important in managing landscape change is that adverse effects are avoided or sufficiently mitigated to ameliorate the effects of the change in land use. The aim is to provide a high amenity environment through appropriate design outcomes, including planting that can provide an adequate substitution for the currently experienced amenity.

5.1 Physical - abiotic attributes

The key abiotic attributes of the site include the landform, its geology, and hydrology. Overall, the site and its context have been modified primarily as a result of historic landform modification and the dumping of spoil, although (as is evident from Figure 3) the west – east patterning of dune ridge landform is still legible. A locally prominent dune ridge traces the southern boundary of the Site, and continues westwards to cross Wylie Road. This dune forms a recognisable and prominent feature when travelling along Foxton Beach Road (refer to photo 10).

Running parallel to this aforementioned dune, a smaller dune is evident on the Site's western boundary, but diminished in scale and becoms fragmented within the Site. Immediately to the north and east, the dune landforms have been destroyed within the airfield and the industrial area Beyond the industrial area, to the east and south east, the dune landforms are no longer apparent within the Foxton township. The Site therefore occupies a location on the edge of the modified dunefield.

The total area of earthworks will be 28.44ha, with a cut volume of 207,424.70m^3, and a fill volume of 152,024.29m^3. This will result in the loss of the dune landform patterning within the Site, but the primary and most dominant prominent dunes, on the southern boundaryof the Site will be retained. Given the existing modification, and the retention of the primary dune features, it is considered that the degree of change will be low.

The proposal will require no changes in the hydrological systems of the area.

5.2 Physical - biophysical biotic attributes

The biotic attributes of the Site are the living organisms which shape an ecosystem. The proposal will only necessitate the clearance of predominantly noxious exotic weeds within the Site, and the anticipated change to the biotic attributes resulting from the proposal are will be very small.

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5.3 Physical – land use and built attributes

As identified above, the Site occupies a location on the margin of the settlement, and whilst unbuilt, displays a character that is modified and peri-urban, its naturalness degraded – in particular – by the presence of the industrial area immediately to the east, by its use for the dumping of spoil, and by its degraded, and weed infested appearance.

It is considered that the change resulting from the proposal on the land use and built attributes of the Site will be very small.

5.4 Physical – archaeology and cultural attributes

The AEE reports that there are no overlays or significant heritage features associated with the Site. It notes that there is a moa hunter midden to the east but this will not be affected by the proposal.

5.5 Perceptual attributes

Experiential attributes comprise the interpretation of human experience of the landscape. This includes visible changes in the character of the landscape – its naturalness as well as its sense of wildness and remoteness including effects on natural darkness of the night sky.

The potential adverse visual amenity effect of the proposal is discussed in detail in section 6.6 below and this section concludes that the level of potential adverse visual amenity effect for the majority of individuals will be – at most – low.

The Site is visually screened, or is – for the most part – unremarkable when seen from the surrounding area, and therefore lacks memorability. Due to its weedy condition it lacks coherence and displays very limited naturalness. The exception with respect to the prominence of the Site's features is the parabolic dune ridge on its southern boundary, which forms a feature of the view from Foxton Beach Road and nearby residential properties.

The proposal will result in the introduction of a cluster of structures that are of an appearance, and scale that has the potential to diverge from the rural character of the site and its context to the west, although the character of the development will be in keeping with the developed landscape to the east and south east.

The low-lying landform, containment provided by shelterbelts in the wider area, and proposed mitigation landform and planting will ensure that the visibility of the proposed structures will be very limited.

It is the opinion of the author that the change in experiential attributes of the area will be very small.

5.6 Social, cultural and associative attributes

Social, cultural and associative values are linked with individual's relationship with the landscape, their memories, the way they interact with and use the landscape and the historical evidence of that relationship.

The Site is separated from public viewpoints, and – it is understood – is not subject to any cultural or historical associations. The Site is used informally for recreation – horse riding and dirt biking – and it is possible that individuals attribute some limited value to the Site in this regard.

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Research indicates that public attitudes to solar power are generally supportive, with a ShapeNZ Poll reporting a 69% support for solar power as a preferred energy source[5]. This suggests that public attitudes to a facility generating solar power are unlikely to be negative particularly when the scale and 'intrusiveness' of the facility is minimal.

Overall therefore, it is the opinion of the author that the potential impact on social and associative attributes will be very small.

5.7 Summary of landscape effects

In summary, any landscape effects would be limited to an existing area that has been previously modified (cleared of vegetation). The proposal will result a localised change in the biotic attributes of the Site, but the primary and dominant dune landforms will be retained. The anticipated change in the abiotic attributes will be low.

The experiential attributes would be affected at an immediate site level, but will be low for the majority of individuals outside of the boundaries of the site.

The social and associative attributes of the site will not be affected and overall it is the opinion of the author that – overall – the potential adverse landscape and natural character effect of the proposal will be low.

5.8 Visual amenity effects

As described in section 3.4, the visual catchment of the site is relatively constrained with the exception of the western quadrant.

The primary viewers can be gathered into three main groups, based on a commonality of views-types and geographical locations. Those associated with public viewpoints are as follows:

1. Users of Foxton Beach Road
2. Users of Wylie Road
3. Users of Bergin Road
4. Visitors to the Industrial area

Those associated with private viewpoints are as follows:

1. Occupants of dwellings to the south and south east;
2. Occupants of dwellings to the east
3. Occupants of dwellings to the west;

Within these geographical groups, there exist subgroups, including occupants of residential properties, occupants of vehicles and pedestrians, and visitors to, or occupants of commercial premises and offices. The sensitivity to change within the visual environment of these subgroups varies, with occupants of dwellings being most sensitive, whilst users of the road / occupants of vehicles being least sensitive.

[5] http://www.windenergy.org.nz/store/doc/Wind_Energy_and_Public_Opinion.pdf

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Users of Foxton Beach Road

Represented by photo 10, this viewer group comprises a moderate to high number of transitory individuals with a low sensitivity to change.

At its closest point the road is some 500m from the southern Site boundary and the parabolic dune on the Site's southern boundary contains views to the north. The proposal will retain the existing dune ridge and the proposed activity will be screened from view.

It is the opinion of the author that the potential adverse visual amenity effect will be nil.

Users of Wylie Road

Represented by photo 2, this viewer group comprises a moderate number of transitory individuals with a low sensitivity to change.

At its closest point the road is some 630m from the western Site boundary and the Site is visible, with the scrubby gorse vegetation contrasting with the pastured foreground, and backdropped by the pine trees.

The proposal includes a mitigation planting strip along this western edge, and within 3 years, the planting will have established to a height that eliminates views of the proposed structures from this location.

Notwithstanding this, the structures will be of a dark and recessive finish, and will recede into the dark backdrop of the pine trees.

As such, it is the opinion of the author that the potential adverse visual amenity effect will be low during the construction period (6-7 months), and very low once the vegetation has established.

Users of Bergin Road

Represented by photo 1, this viewer group comprises a low to moderate number of transitory individuals with a low sensitivity to change. Travelling from the settlement, views of the industrial area are partially screened by an existing bund on the southern side of the road. The character of the road, and as experienced by these individuals is of a peri-urban environment, and glimpses of the proposed solar park through the Site entrance will be in keeping with this character. Views from the road will otherwise be screened by the proposed planting strip.

It is the opinion of the author that the potential adverse visual amenity effect will be low during the construction period (6-7 months), and very low once the vegetation has established.

Visitors to the Industrial area

Represented by photo 9, this viewer group comprises a low to moderate number of transitory individuals with a low sensitivity to change.

Views from the industrial area will be, for the most part, screened by the existing pine trees. Given the existing character of this neighbouring area, the character of the proposed solar farm will not detract from the amenity of receptors.

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Occupants of dwellings to the south and south east

Represented by photo 10, this viewer group comprises a low number of individuals with a high sensitivity to change. It includes dwellings within Lot 1 DP 311167 (#84), Pt Lot 1 DP 59838 (#62) Lots 1, 2 and 3 DP 407861(#60, #60A and #60B), Lot 3 DP 59838 Lot 1 DP 20355 (#22), Pt Lot 4 DP 2590 (#14) to the south. To the south east of the Site, a cluster of residential settlement is accessed from Herrington Street.

The Site is currently, and will continue to be screened from all of these individuals by the existing dune on the Site's southern boundary and it is the opinion of the author that the potential adverse visual amenity effect will be nil.

Occupants of dwellings to the east

This viewer group comprises a very low number of individuals with a high sensitivity to change. It comprises a dwelling within Pt Lot 1 DP 23277 (#13) situated on the dune crest approximately 160m to the south east of the Site boundary. This dwelling is separated from the Site by vegetation. Activity associated with the proposal within the Site will not be apparent from this property and the potential adverse visual amenity effect will be nil.

Lot 32 DP 17402 (#25A) also occupies the dune crest, is accessed from Herrington Street and abuts the Site on its western boundary. This lot is some 1ha in area and is primarily vegetated with exotic trees. It does not contain a dwelling. As with the aforementioned property, activity associated with the proposal within the Site will not be apparent from this property and the potential adverse visual amenity effect will be nil.

Occupants of dwellings to the west

Represented by photo 2, this viewer group comprises a low number of individuals with a high sensitivity to change located some 630m to the west. With the exception of potential glimpses from Lots 1 and 2 DP 347643, residential viewers within this western quadrant are situated to the south west, or north west and landform or vegetation precludes views from these locations.

The proposed change within the Site may be evident during construction, but at the separation distance indicated above, any change will form a fragment of the wider views from these dwellings. Once the solar farm, and the proposed planting strip is established, the Site will be obscured. It is the opinion of the author therefore, that the potential adverse visual amenity effect will be low during the construction period (6-7 months), and very low once the vegetation has established.

5.9 Potential effects arising from solar panels

The potential for glare associated with non-concentrating photovoltaic systems which do not involve mirrors or lenses is relatively limited. PV solar panels are designed to reflect as little sunlight as possible (generally around 2% of the light received[6]), resulting in negligible glare. The reason for this is that PV panels are designed to absorb as much solar energy as possible in order to generate the maximum amount of electricity or heat. The panels will not generally create noticeable glare compared with an existing roof or building surfaces (NSW Department of Planning 2010). Seen from above (such as from aircraft) they appear dark grey and do not cause a glare or reflectivity hazard. Solar photovoltaic farms have been installed on a number of airports around the world.

[6] Spaven Consulting, 2011, Solar Photovoltaic Energy Facilities: Assessment of potential for impact on aviation , report prepared January 2011, for RPS Planning and Development.

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Other onsite infrastructure that may cause glare or reflections depending on the sun angle, include:

- Steel array mounting - array mounting would be steel or aluminium.
- Temporary construction site offices
- Inverter stations
- Transmissions line power poles.

The proposed facility will be contained by mitigation planting and – located within a flat landscape – will not be visible to the majority of viewers since few individuals are offered elevated views from dwelling toward the Site. Where these views are possible, they tend to be from the 'rear' of dwelling, so any glare will not affect primary views from these properties.

6.0 ASSESMENT AGAINST THE STATUTORY FRAMEWORK

Objectives and policies of relevance for the Rural Zone focus on the mitigation of adverse effects, particularly on rural character and amenity, and impacts arising from development on individual residential properties. In addition, provisions seek the protection of significant indigenous vegetation, and outstanding natural landscapes and features. The Site does not contain / is not overlain by significant indigenous vegetation, and outstanding natural landscapes and features.

The existing environment has been modified, and its biotic values degraded as a result of vegetation clearance. Within the wider landscape context the Site adjoins the Foxton settlement and areas where development has resulted in a marked change on the character of the landscape, with modification to the relic dune landforms.

The proposal will not detract from natural character or landscape values. The potential adverse landscape effect of the proposal are determined to be low (less than minor).

No areas of ecological value are present within the site, and the proposal will not require the removal of any native vegetation of any significance.

The site and its context retain a rural and productive character with a flat and low-lying landscape. Although the landscape has a spacious, open and exposed feeling, views are frequently curtailed or constrained by shelterbelts, or even low vegetation or relic dune features.

The proposed facility will be of a scale and character that has the potential to contrast with the existing landscape character, but the flatness of the terrain, the limited height of the proposed structures and the ability to create screening using relatively low mitigation plantings will ensure that the facility is visually contained and will not be evident from its landscape context. As such, it will maintain the existing rural character and will (with the exception of two neighbouring properties) generate a low level of potential adverse visual amenity effect.

7.0 CONCLUSION

Far North Solar Farms Ltd seeks consent to construct a photovoltaic solar farm within the subject Site.

The site is located within the Rural Zone, although it adjoins area zoned Industrial and Residential. It is not affected by any landscape or natural character overlays in the statutory documents.

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The landscape to the west and north west has a rural, spacious, open and exposed feeling. Views to the Site tend to be constrained by shelterbelts, and landform. Views from the south and east are precluded by relic dune ridges and vegetation. The airfield screens views from the north.

The proposed facility will be of a scale and character that has the potential to contrast with the existing landscape character, but the flatness of the terrain, the limited height of the proposed structures, the retention of the dune feature on the southern boundary of the Site, and the ability to create screening using mitigation plantings will ensure that the facility is visually contained and will not be evident from its landscape context.

It is the opinion of the author that the resulting landscape, natural character of the proposal will be – at most – low. The long term potential adverse visual amenity effect will be (at most) low for all individuals.

The proposal will be consistent with the provisions of the statutory instruments where they apply to the scope of this report, and the proposal is considered to be appropriate from a landscape and visual perspective.

Simon Cocker

26 June 2022

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APPENDIX 1: Figures

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Far North Solar Farm Ltd.
Bergin Road, Foxton

FIGURE 1: Location of the site

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Far North Solar Farm Ltd.
Bergin Road, Foxton

FIGURE 2a: The proposal

PRELIMINARY DESIGN

N
W E
S

GENERAL NOTES

1. MODULE TYPE: 545Wp,
2. TOTAL QUANTITY 72,464 Nos.
3. TOTAL POWER 39,493 kWp.
4. 2 x 28, 2 x 14 MODULE TABLE.,
5. 28 MODULE PER STRING.
6. TILT ANGLE 20° , PITCH 7.1 m.
7. TOTAL MODULE AREA 333,666 sq.m (33.4 ha).
8. ALL DIMENSIONS ARE IN METER UNLESS OTHERWISE SPECIFIED.
9. FINAL LAYOUT WILL BE DETERMINED AFTER SITE SURVEY.

NORTH FACE TABLE OPTION
LR 545Wp MODULE

LEGEND

- SITE BOUNDARY
- PLANT ROAD
- PV MODULE (LONGI SOLAR 545Wp) (2 x 28 MODULE FIELD N-FACE TABLE)
- PV MODULE (LONGI SOLAR 545Wp) (2 x 14 MODULE FIELD N-FACE TABLE)
- TWIN INVERTER STATION
- RAMPART
- GAS PIPELINE
- TREES

REFERENCE DRAWINGS

No.	DRAWING TITLE	DRAWING No.

R	DATE	DESCRIPTION OF REVISION	REMARKS
D	10-05-2022	DRAFT - UPDATE DUNES CLEARANCE AT SOUTH SIDE	
C	05-05-2022	DRAFT - UPDATE GATE, TRESS AND DUNES CUT DOWN	
B	03-03-2022	DRAFT - GAS PIPELINE AND BOUNDARY UPDATED	
A	28-01-2022	DRAFT	

PROJECT NAME :

GANESIS - FOXTON - 39.5MWp
NEW ZEALAND

OWNER'S ENGINEER :

GENERAL CONTRACTOR :

AQUILA CAPITAL
GENERATING ESSENTIAL INVESTMENTS

Aquila Capital Renewables Asia Pte. Ltd.
138 Market Street #15-03 CapitaGreen
Singapore 048946. www.aquila-capital.com

DRAWN BY	: HARI	SIGN H.S
DATE	: 10-05-2022	
CHECKED BY	: ARUL	A.M
DATE	: 10-05-2022	
APPROVED BY	: TIMO	T.K
DATE	: 10-05-2022	

TITLE :

MODULE GENERAL ARRANGEMENT LAYOUT

DRAWING No.

ACRA-NZ-GS-FXN-001

SHEET SIZE	SHEET	SCALE	REV
A1	1 OF 1	1:3500	D

EMERGENCY SERVICE ENTRANCE
SIDE ENTRANCE
MAIN ENTRANCE
GAS PIPELINE
POND (1,429 sq.m)
MV ROOM
UNDERGROUND CABLE TO GRID
5.0m wide screen planting strip

Species	Common name	grade	% mix	spacing
Austroderia toetoe	Toe toe	1L	15	1.4
Coprosma areolata	Thin leaf coprosma	1L	5	1.4
Kunzea amathicola	rawiwitoa	0.5L	30	1.4
Leucopogon fasciculatus	mingimingi	1L	10	1.4
Muehlenbeckia complexa	pohuehue	1L	20	1.4
Phormium tenax	harakeke	1L	10	1.4
Plagianthus divaricatus	makaka	1L	5	1.4
Pseudopanax crassifolius	horoeka	1L	5	1.4

PV SYSTEM DETAILS	
SITE COORDINATES	Lat: -40.46°N, Lon:175.27°E
MODULE TYPE	Longi 545W
MODULE POWER (Wp)	545
MODULE QTY.	72,464
MOUNTING STRUCTURE TYPE	NORTH FACE TABLE
MOUNTING STRUCTURE TILT	20°
PITCH	7.1 m
TABLE ARRANGEMENT	2 x 28, 2 x 14
No. OF MODULE PER STRING	28
NOMINAL POWER (kWp)	**39,493**
INVERTER	POWER ELECTRONICS 4390
INV. Nom. POWER (kWac)	4390
INVERTER QTY.	8
AC POWER (kWac)	**35,120.00**
DC/AC RATIO	1.12
MODULE AREA	33.4 ha

The Site

Dune feature to be retained

Scale 1 : 3,500 @ A3

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FIGURE 2b: Landform features to be retained

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FIGURE 3: Topography of the Site and its context

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FIGURE 4: The site in context

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Proposed solar farm

0m 400m 800m 160m

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FIGURE 5: Identified landscape values

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Photo 1: View to west along metal access track

Photo taken: 10 April 2022

Far North Solar Farm Ltd.
Bergin Road, Foxton

Photographs (taken with digital equivalent of 50mm focal length unless otherwise specified)

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Photo 2: View to Site from Wylie Road

Photo taken: 10 April 2022

Far North Solar Farm Ltd.
Bergin Road, Foxton

Photographs (taken with digital equivalent of 50mm focal length unless otherwise specified)

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Photo 3: View Site from airfield

Photo taken: 10 April 2022

Far North Solar Farm Ltd.
Bergin Road, Foxton

Photographs (taken with digital equivalent of 50mm focal length unless otherwise specified)

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Photo 4: View Site from airfield

Photo taken: 10 April 2022

Far North Solar Farm Ltd.
Bergin Road, Foxton

Photographs (taken with digital equivalent of 50mm focal length unless otherwise specified)

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Photo 5: View to south east across Site

Photo taken: 10 April 2022

Far North Solar Farm Ltd.
Bergin Road, Foxton

Photographs (taken with digital equivalent of 50mm focal length unless otherwise specified)

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Photo 6: View to north east across Site

Photo taken: 10 April 2022

Far North Solar Farm Ltd.
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Photographs (taken with digital equivalent of 50mm focal length unless otherwise specified)

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Photo 7: View to north east across Site

Photo taken: 10 April 2022

Far North Solar Farm Ltd.
Bergin Road, Foxton

Photographs (taken with digital equivalent of 50mm focal length unless otherwise specified)

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Photo 8: View to east across Site

Photo taken: 10 April 2022

Far North Solar Farm Ltd.
Bergin Road, Foxton

Photographs (taken with digital equivalent of 50mm focal length unless otherwise specified)

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Photo 9: View to south along western edge of industrial area

Photo taken: 10 April 2022

Far North Solar Farm Ltd.

Bergin Road, Foxton

Photographs (taken with digital equivalent of 50mm focal length unless otherwise specified)

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Photo 10: View to north from Foxton Beach Road

Photo taken: 10 April 2022

Far North Solar Farm Ltd.
Bergin Road, Foxton

Photographs (taken with digital equivalent of 50mm focal length unless otherwise specified)

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APPENDIX 2: Landscape and Visual Effects Assessment Methodology

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Landscape and Visual Effects Assessment Methodology

Introduction

The landscape and visual effects assessment process provides a framework for assessing and identifying the nature and level of likely effects that may result from a proposed development. Such effects can occur in relation to changes to physical elements, the existing character of the landscape and the experience of it. In addition, the landscape assessment method may include an iterative design development processes which includes stakeholder involvement. The outcome of any assessment approach should seek to avoid, remedy or mitigate adverse effects. A separate assessment is required to assess changes in natural character in coastal areas and other waterbodies.

When undertaking landscape and visual effects assessments, it is important that a structured and consistent approach is used to ensure that findings are clear and objective. Judgement should always be based on skills and experience, and be supported by explicit evidence and reasoned argument.

While landscape and visual effects assessments are closely related, they form separate procedures. The assessment of the potential effect on the landscape forms the first step in this process and is carried out as an effect on an environmental resource (i.e. landscape elements, features and character). The assessment of visual effects considers how changes to the physical landscape affect the viewing audience. The types of effects can be summarised as follows:

> **Landscape effects:**
> *Change in the physical landscape, which may change its characteristics or qualities.*
>
> **Visual effects:**
> *Change to views which may change the visual amenity experienced by people.*

The policy context, existing landscape resource and locations from which a development or change is visible all inform the 'baseline' for landscape and visual effects assessments. To assess effects, the landscape must first be described, including an understanding of the key landscape characteristics and qualities. This process, known as landscape characterisation, is the basic tool for understanding landscape character and may involve subdividing the landscape into character areas or types. The condition of the landscape (i.e. the state of an individual area of landscape or landscape feature) should also be described alongside a judgement made on the value or importance of the potentially affected landscape.

This outline of the landscape and visual effects assessment methodology has been undertaken with reference to the Quality Planning Landscape Guidance Note1[1] and its signposts to examples of best practice which include the UK guidelines for landscape and visual impact assessment[2] and the New Zealand Landscape Institute Guidelines for Landscape Assessment[3].

Assessing landscape effects requires an understanding of the nature of the landscape resource and the magnitude of change which results from a proposed development to determine the overall level of landscape effects.

Nature of the landscape resource

Assessing the nature of the landscape resource considers both the susceptibility of an area of landscape to change and the value of the landscape. This will vary upon the following factors:

- Physical elements such as topography / hydrology / soils / vegetation;
- Existing land use;
- The pattern and scale of the landscape;

[1] http://www.qualityplanning.org.nz/index.php/planning-tools/land/landscape
[2] Landscape Institute and Institute of Environmental Management and Assessment (2013) Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA3)
[3] Best Practice Note Landscape Assessment and Sustainable Management 10.1, NZILA

- Visual enclosure / openness of views and distribution of the viewing audience;
- The zoning of the land and its associated anticipated level of development;
- The value or importance placed on the landscape, particularly those confirmed in statutory
- documents; and
- The scope for mitigation, appropriate to the existing landscape.

The susceptibility to change takes account of both the attributes of the receiving environment and the characteristics of the proposed development. It considers the ability of a specific type of change occurring without generating adverse effects and/or achievement of landscape planning policies and strategies.

Landscape value derives from the importance that people and communities, including tangata whenua, attach to particular landscapes and landscape attributes. This may include the classification of

Outstanding Natural Landscape (RMA s.6(b)) based on important biophysical, sensory/ aesthetic and associative landscape attributes, which have potential to be affected by a proposed development.

Magnitude of Landscape Change

The magnitude of landscape change judges the amount of change that is likely to occur to existing areas of landscape, landscape features, or key landscape attributes. In undertaking this assessment, it is important that the size or scale of the change is considered within the geographical extent of the area influenced and the duration of change, including whether the change is reversible. In some situations, the loss /change or enhancement to existing landscape elements such as vegetation or earthworks should also be quantified.

When assessing the level of landscape effects, it is important to be clear about what factors have been considered when making professional judgements. This can include consideration of any benefits which result from a proposed development. Table 1 below helps to explain this process. The tabulating of effects is only intended to inform overall judgements.

Contributing factors		Higher	Lower
Nature of Landscape Resource	**Susceptibility to change**	The landscape context has limited existing landscape detractors which make it highly vulnerable to the type of change which would result from the proposed development.	The landscape context has many detractors and can easily accommodate the proposed development without undue consequences to landscape character.
	The value of the landscape	The landscape includes important biophysical, sensory and associative attributes. The landscape requires protection as a matter of national importance (ONF/L).	The landscape lacks any important biophysical, sensory or associative attributes. The landscape is of low or local importance.
Magnitude of Change	**Size or scale**	Total loss or addition of key features or elements. Major changes in the key characteristics of the landscape, including significant aesthetic or perceptual elements.	The majority of key features or elements are retained. Key characteristics of the landscape remain intact with limited aesthetic or perceptual change apparent.
	Geographical extent	Wider landscape scale.	Site scale, immediate setting.
	Duration and reversibility	Permanent. Long term (over 10 years).	Reversible. Short Term (0-5 years).

Table 1: Determining the level of landscape effects

Visual Effects

To assess the visual effects of a proposed development on a landscape, a visual baseline must first be defined. The visual 'baseline' forms a technical exercise which identifies the area where the development may be visible, the potential viewing audience, and the key representative public viewpoints from which visual effects are assessed.

The viewing audience comprises the individuals or groups of people occupying or using the properties, roads, footpaths and public open spaces that lie within the visual envelope or 'zone of visual influence' of the site and proposal. Where possible, computer modelling can assist to determine the theoretical extent of visibility together with field work undertaken to confirm this. Where appropriate, key representative viewpoints should be agreed with the relevant local authority.

Nature of the viewing audience

The nature of the viewing audience is assessed in terms of the susceptibility of the viewing audience to change and the value attached to views. The susceptibility of the viewing audience is determined by assessing the occupation or activity of people experiencing the view at particular locations and the extent to which their interest or activity may be focused on views of the surrounding landscape. This relies on a landscape architect's judgement in respect of visual amenity and reaction of people who may be affected by a proposal. This should also recognise that people more susceptible to change generally include: residents at home, people engaged in outdoor recreation whose attention or interest is likely to be focused on the landscape and on particular views; visitors to heritage assets or other important visitor attractions; and communities where views contribute to the landscape setting.

The value or importance attached to particular views may be determined with respect to its popularity or numbers of people affected or reference to planning instruments such as viewshafts or view corridors.

Important viewpoints are also likely to appear in guide books or tourist maps and may include facilities provided for its enjoyment. There may also be references to this in literature or art, which also acknowledge a level of recognition and importance.

Magnitude of Visual Change

The assessment of visual effects also considers the potential magnitude of change which will result from views of a proposed development. This takes account of the size or scale of the effect, the geographical extent of views and the duration of visual change which may distinguish between temporary (often associated with construction) and permanent effects where relevant. Preparation of any simulations of visual change to assist this process should be guided by best practice as identified by the NZILA[4].

When determining the overall level of visual effect, the nature of the viewing audience is considered together with the magnitude of change resulting from the proposed development. Table 2 has been prepared to help guide this process:

Contributing factors		Higher	Lower
Nature of Landscape Resource	**Susceptibility to change**	Views from dwellings and recreation areas where attention is typically focussed on the landscape..	Views from places of employment and other places where the focus is typically incidental to its landscape context. Views from transport corridors.
	The value of the landscape	Viewpoint is recognised by the community such as an important view shaft, identification on tourist maps or in art and literature. High visitor numbers.	Viewpoint is not typically recognised or valued by the community. Infrequent visitor numbers..
Magnitude of Change	**Size or scale**	Loss or addition of key features in the view. High degree of contrast with existing landscape elements (i.e. in terms of form scale, mass, line, height, colour and texture). Full view of the proposed development	Most key features of view retained. Low degree of contrast with existing landscape elements (i.e. in terms of form scale, mass, line, height, colour and texture. Glimpse / no view of the proposed development.
	Geographical extent	Front on views. Near distance views; Change visible across a wide area.	Oblique views. Long distance views. Small portion of change visible.
	Duration and reversibility	Permanent. Long term (over 15 years).	Transient / temporary. Short Term (0-5 years).

[4] Best Practice Guide: Visual Simulations BPG 10.2, NZILA

Nature of Effects

In combination with assessing the level of effects, the landscape and visual effects assessment also considers the nature of effects in terms of whether this will be positive (beneficial) or negative (adverse) in the context within which it occurs. Neutral effects can also occur where landscape or visual change is benign.

It should also be noted that a change in a landscape does not, of itself, necessarily constitute an adverse landscape or visual effect. Landscape is dynamic and is constantly changing over time in both subtle and more dramatic transformational ways, these changes are both natural and human induced. What is important in managing landscape change is that adverse effects are avoided or sufficiently mitigated to ameliorate the effects of the change in land use. The aim is to provide a high amenity environment through appropriate design outcomes.

This assessment of the nature effects can be further guided by Table 3 set out below:

Nature of effect	Use and definition
Adverse (negative):	The proposed development would be out of scale with the landscape or at odds with the local pattern and landform which results in a reduction in landscape and / or visual amenity values
Neutral (benign):	The proposed development would complement (or blend in with) the scale, landform and pattern of the landscape maintaining existing landscape and / or visual amenity values
Beneficial (positive):	The proposed development would enhance the landscape and / or visual amenity through removal of restoration of existing degraded landscapes uses and / or addition of positive elements or features

Table 3: Determining the Nature of Effects

Cumulative Effects

During the scoping of an assessment, where appropriate, agreement should be reached with the relevant local authority as to the nature of cumulative effects to be assessed. This can include effects of the same type of development (e.g. wind farms) or the combined effect of all past, present and approved future development[5] of varying types, taking account of both the permitted baseline and receiving environment. Cumulative effects can also be positive, negative or benign.

Cumulative Landscape Effects

Cumulative landscape effects can include additional or combined changes in components of the landscape and changes in the overall landscape character. The extent within which cumulative landscape effects are assessed can cover the entire landscape character area within which the proposal is located, or alternatively, the zone of visual influence from which the proposal can be observed.

Cumulative Visual Effects

Cumulative visual effects can occur in combination (seen together in the same view), in succession (where the observer needs to turn their head) or sequentially (with a time lapse between instances where proposals are visible when moving through a landscape). Further visualisations may be required to indicate the change in view compared with the appearance of the project on its own.

Determining the nature and level of cumulative landscape and visual effects should adopt the same approach as the project assessment in describing both the nature of the viewing audience and magnitude of change leading to a final judgement. Mitigation may require broader consideration which may extend beyond the geographical extent of the project being assessed.

Determining the Overall Level of Effects

[5] The life of the statutory planning document or unimplemented resource consents

The landscape and visual effects assessment concludes with an overall assessment of the likely level of landscape and visual effects. This step also takes account of the nature of effects and the effectiveness of any proposed mitigation.

This step informs an overall judgement identifying what level of effects are likely to be generated as indicated in Table 4 below. This table which can be used to guide the level of landscape and visual effects uses an adapted seven-point scale derived from NZILA's Best Practice Note.

	Effect rating	Use and definition
More than minor . . . . **Minor** . . . . . . **Less than minor**	**Very high**	Total loss of key elements / features / characteristics, i.e. amounts to a complete change of landscape character
	High	Major modification or loss of most key elements / features / characteristics, i.e. little of the pre-development landscape character remains. Concise Oxford English Dictionary Definition High: adjective- Great in amount, value, size, or intensity
	Moderate to high	Modifications of several key elements / features / characteristics of the baseline, i.e. the pre-development landscape character remains evident but materially changed.
	Moderate	Partial loss of or modification to key elements / features / characteristics of the baseline, i.e. new elements may be prominent but not necessarily uncharacteristic within the receiving landscape. Concise Oxford English Dictionary Definition Moderate: adjective- average in amount, intensity, quality or degree
	Moderate to low	Minor loss of or modification to one or more key elements / features / characteristics, i.e. new elements are not prominent or uncharacteristic within the receiving landscape.
	Low	No material loss of or modification to key elements / features / characteristics. i.e. modification or change is not uncharacteristic and absorbed within the receiving landscape. Concise Oxford English Dictionary Definition Low: adjective- 1. Below average in amount, extent, or intensity
	Very low	Little or no loss of or modification to key elements/ features/ characteristics of the baseline, i.e. approximating a 'no change' situation.

Table 4: Determining the overall level of landscape and visual effects

Determination of "minor"

Decision makers determining whether a resource consent application should be notified must also assess whether the effect on a person is less than minor6[6] or an adverse effect on the environment is no more than minor[7]. Likewise, when assessing a non-complying activity, consent can only be granted if the s104D 'gateway test' is satisfied. This test requires the decision maker to be assured that the adverse effects of the activity on the environment will be 'minor' or not be contrary to the objectives and policies of the relevant planning documents.

These assessments will generally involve a broader consideration of the effects of the activity, beyond the landscape and visual effects. Through this broader consideration, guidance may be sought on whether the likely effects on the landscape resource or effects on a person are considered in relation to 'minor'. It must also be stressed that more than minor effects on individual elements or viewpoints does not necessarily equate to more than minor effects on the wider landscape resource. In relation to this assessment, moderate-low level effects would generally equate to 'minor'.

[6] RMA, Section 95E
[7] RMA Section 95D

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APPENDIX 3: Effects ranking and descriptor

Determination of landscape quality		
Category	Criteria	Typical Example
High - Exceptional	Strong landscape structure, characteristics, patterns, balanced combination of landform and land cover	International or nationally recognised site – national park.
	Appropriate management for land use and land cover	
	Distinct features worthy of conservation	
	Sense of place	
	No detracting features	
High	Strong landscape structure, characteristics, patterns, balanced combination of landform and land cover	Nationally or regionally recognised site – national park
	Appropriate management for land use and land cover but potential scope for improvement.	
	Distinct features worthy of conservation	
	Sense of place	
	Occasional detracting features	
Good	Recognisable landscape structure, characteristics, patterns, balanced combination of landform and land cover still evident	Nationally, regionally recognised site all or great majority of area of local landscape importance
	Scope to improve management for land use and land cover	
	Some features worthy of conservation	
	Sense of place	
	Some detracting features	
Ordinary	Distinguishable landscape structure, characteristic patterns of landform and land cover often masked by landuse	
	Some features worthy of conservation	
	Some detracting features	
Poor	Weak landscape structure, characteristic patterns of landform and land cover often masked by landuse	
	Mixed land use evident	
	Lack of management and intervention has resulted in degradation	
	Frequent detracting features	
Very poor	Degraded landscape structure, characteristic patterns of landform and land cover are masked by landuse	
	Mixed land use dominates	
	Lack of management and intervention has resulted in degradation	
	Extensive detracting features	
Damaged landscape	Damaged landscape structure	
	Single land use	
	Disturbed or derelict land requires treatment	
	Detracting features dominate.	

Table 2 has been adapted for NZ conditions from an example of threshold criteria used by practitioners in the United Kingdom. The original document was prepared by Jeff Stevenson Associates and published in Guidelines for Landscape and Visual Assessment ("GLVIA") 3rd Edition. Landscape Institute (UK) and IEMA 2013.

PO Box 222, Whangarei 0140,New Zealand
Tel: 09 430 3793 Mobile: 027 4788812
Email: simon@scla.nz

Horowhenua DISTRICT COUNCIL

AFFECTED PERSON'S WRITTEN APPROVAL TO AN ACTIVITY THAT IS THE SUBJECT OF A RESOURCE CONSENT APPLICATION
SECTION 95E(3), RESOURCE MANAGEMENT ACT 1991

TO BE COMPLETED BY THE APPLICANT REQUESTING APPROVAL

Full Name(s) Far North Solar Farm Limited

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Description of Proposal Solar Farm
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Shown on Plans Site plan attached

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Of (address) [redacted]

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Signature/s [redacted]

Date 31/5/2022 Contact Phone [redacted] E-Mail [redacted]

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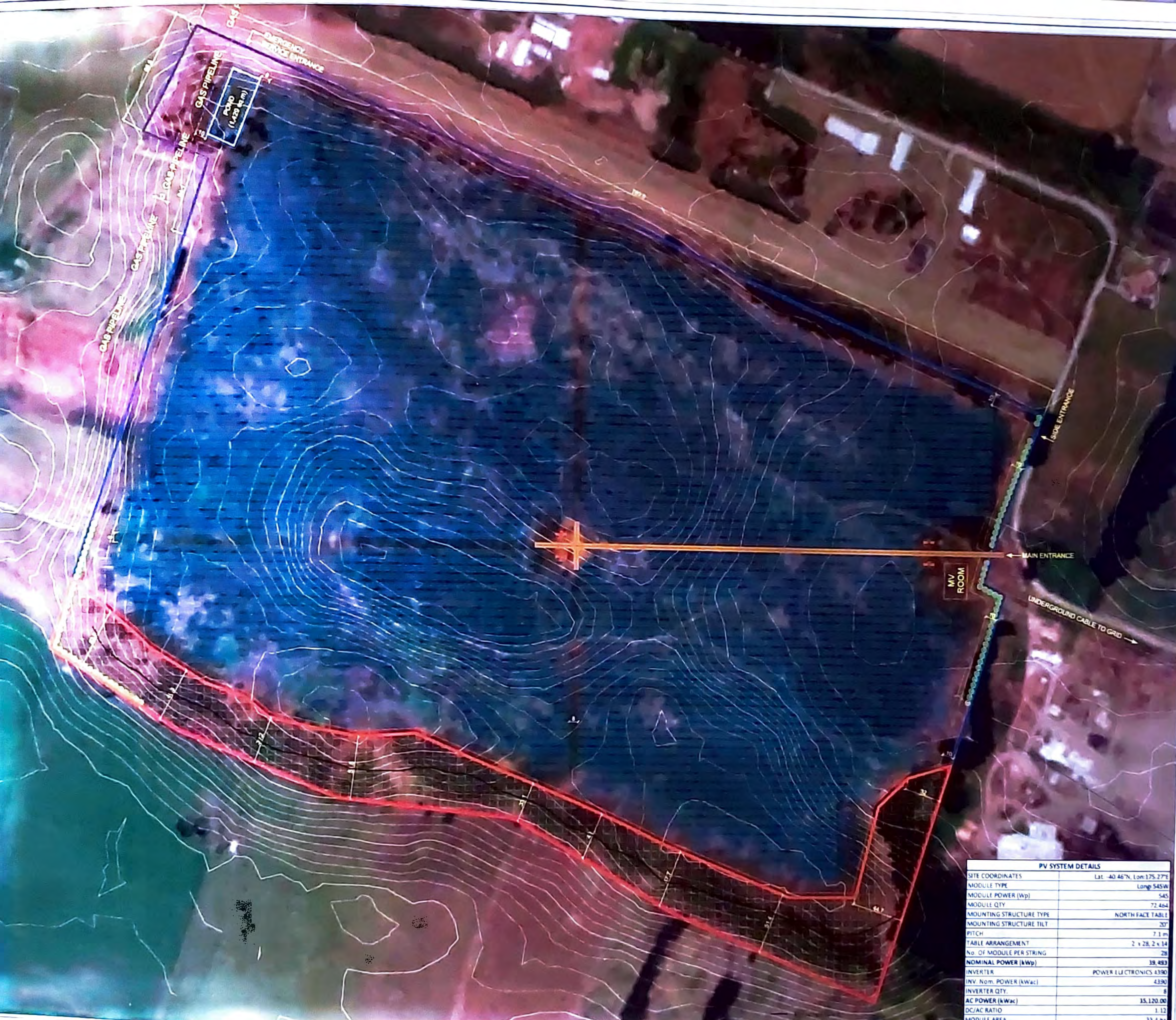

PV SYSTEM DETAILS	
SITE COORDINATES	Lat: -40.46°N, Lon:175.27°E
MODULE TYPE	Longi 545W
MODULE POWER (Wp)	545
MODULE QTY	72,464
MOUNTING STRUCTURE TYPE	NORTH FACE TABLE
MOUNTING STRUCTURE TILT	20°
PITCH	7.1 m
TABLE ARRANGEMENT	2 x 28, 2 x 14
No. OF MODULE PER STRING	28
NOMINAL POWER (kWp)	**39,493**
INVERTER	POWER ELECTRONICS 4390
INV. Nom. POWER (kWac)	4390
INVERTER QTY.	8
AC POWER (kWac)	**35,120.00**
DC/AC RATIO	1.12
MODULE AREA	33.4 ha

PRELIMINARY DESIGN

N
W E
S

GENERAL NOTES

1. MODULE TYPE 545Wp
2. TOTAL QUANTITY 72,464 Nos
3. TOTAL POWER 39,493 kWp
4. 2 x 28, 2 x 14 MODULE TABLE
5. 28 MODULE PER STRING
6. TILT ANGLE 20° PITCH 7.1 m
7. TOTAL MODULE AREA [illegible] sq m (33.4 ha)
8. ALL DIMENSIONS ARE IN METER UNLESS OTHERWISE SPECIFIED
9. FINAL LAYOUT WILL BE DETERMINED AFTER SITE SURVEY

NORTH FACE TABLE OPTION LR 545Wp MODULE

LEGEND

- SITE BOUNDARY
- PLANT ROAD
- PV MODULE (LONGI SOLAR 545Wp) (2 x 28 MODULE FIELD N-FACE TABLE)
- PV MODULE (LONGI SOLAR 545Wp) (2 x 14 MODULE FIELD N-FACE TABLE)
- TWIN INVERTER STATION
- RAMPART
- GAS PIPELINE
- TREES

REFERENCE DRAWINGS		
No.	DRAWING TITLE	DRAWING No.

R	DATE	DESCRIPTION OF REVISION	REMARKS
D	[illegible]	DRAFT UPDATE DUNES CLEARANCE AT SOUTH SIDE	
C	[illegible]	DRAFT UPDATE GATE, TREES AND DUNES CUT DOWN	
B	[illegible]	DRAFT GAS PIPELINE AND BOUNDARY UPDATED	
A	[illegible]	DRAFT	

PROJECT NAME

GANESIS - FOXTON - 39.5MWp
NEW ZEALAND

OWNER'S ENGINEER

GENERAL CONTRACTOR

AQUILA CAPITAL — GENERATING ESSENTIAL INVESTMENTS

Aquila Capital Renewables Asia Pte. Ltd
138 Market Street #15-03 CapitaGreen
Singapore 048946 www.aquila-capital.com

TITLE: MODULE GENERAL ARRANGEMENT LAYOUT

DRAWING No.: ACRA-NZ-GS-FXN-001

SHEET SIZE	SHEET	SCALE	REV
A1	1 OF 1	1:3500	D

Horowhenua DISTRICT COUNCIL

AFFECTED PERSON'S WRITTEN APPROVAL TO AN ACTIVITY THAT IS THE SUBJECT OF A RESOURCE CONSENT APPLICATION

SECTION 95E(3), RESOURCE MANAGEMENT ACT 1991

TO BE COMPLETED BY THE APPLICANT REQUESTING APPROVAL

Full Name(s) Far North Solar Farm Limited

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Description of Proposal Solar Farm

Solar farm providing local power for approx. 5000 homes.

Shown on Plans Site plan attached

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Signature/s [redacted]

Date 14/6/22 Contact Phone [redacted]

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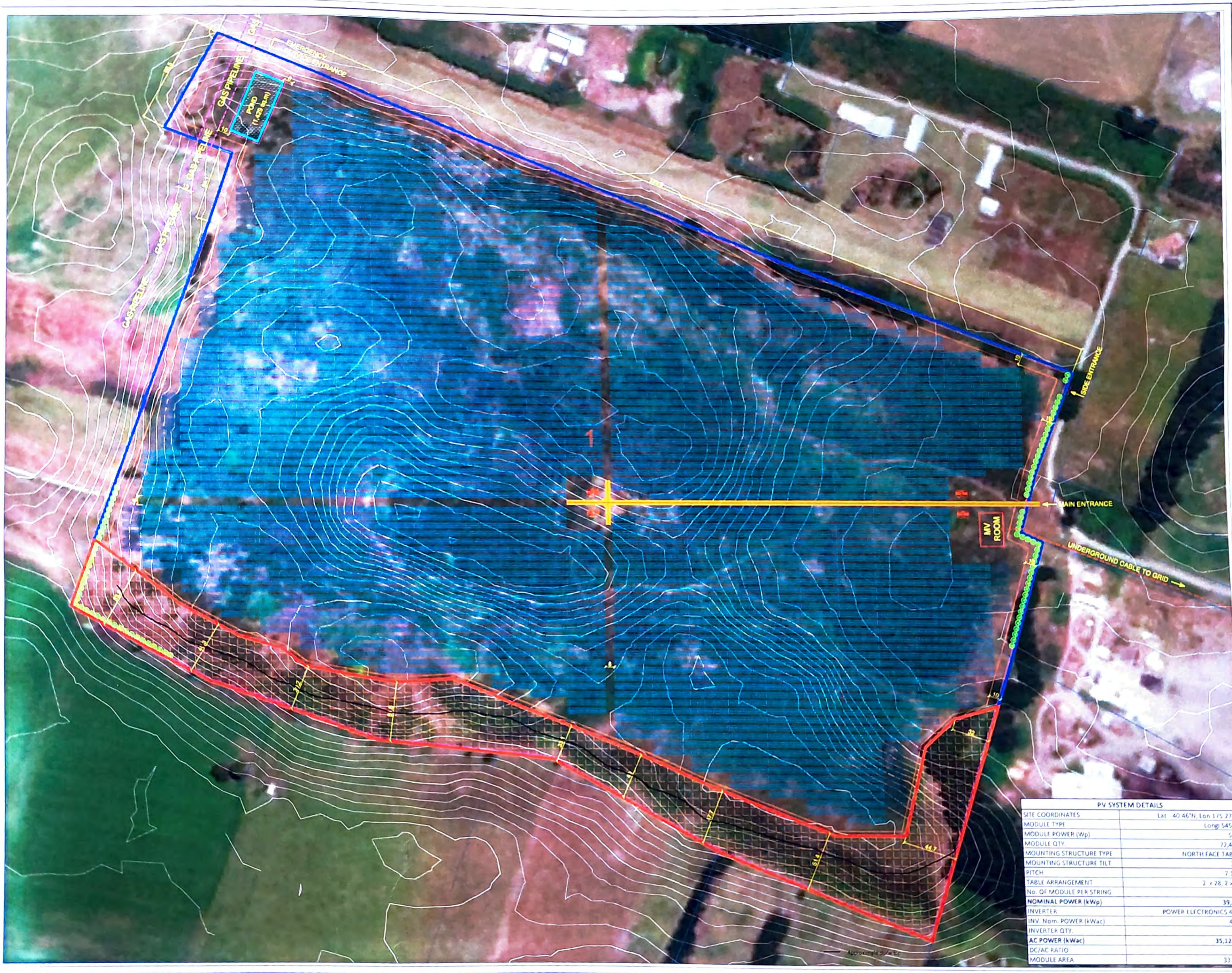
PRELIMINARY DESIGN



PV SYSTEM DETAILS	
SITE COORDINATES	Lat -40 46'N, Lon 175 27'E
MODULE TYPE	Longi 545W
MODULE POWER (Wp)	545
MODULE QTY.	72,464
MOUNTING STRUCTURE TYPE	NORTH FACE TABLE
MOUNTING STRUCTURE TILT	20°
PITCH	7.1 m
TABLE ARRANGEMENT	2 x 28, 2 x 14
No. OF MODULE PER STRING	28
NOMINAL POWER (kWp)	**39,493**
INVERTER	POWER ELECTRONICS 4390
INV. Nom. POWER (kWac)	4390
INVERTER QTY.	8
AC POWER (kWac)	**35,120.00**
DC/AC RATIO	1.12
MODULE AREA	33.4 ha

N W E S

GENERAL NOTES

1. MODULE TYPE 545Wp
2. TOTAL QUANTITY 72,464 Nos
3. TOTAL POWER 39 493 kWp
4. 2 x 28, 2 x 14 MODULE TABLE
5. 28 MODULE PER STRING
6. TILT ANGLE 20°. PITCH 7.1 m
7. TOTAL MODULE AREA 333,666 sq m (33.4 ha)
8. ALL DIMENSIONS ARE IN METER UNLESS OTHERWISE SPECIFIED
9. FINAL LAYOUT WILL BE DETERMINED AFTER SITE SURVEY

NORTH FACE TABLE OPTION LR 545Wp MODULE

LEGEND

- SITE BOUNDARY
- PLANT ROAD
- PV MODULE (LONGI SOLAR 545Wp) (2 x 28 MODULE FIELD N-FACE TABLE)
- PV MODULE (LONGI SOLAR 545Wp) (2 x 14 MODULE FIELD N-FACE TABLE)
- TWIN INVERTER STATION
- RAMPART
- GAS PIPELINE
- TREES

REFERENCE DRAWINGS

No	DRAWING TITLE	DRAWING No

R	DATE	DESCRIPTION OF REVISION	REMARKS
D	10-05-2022	DRAFT - UPDATE DUNES CLEARANCE AT SOUTH SIDE	
C	05-05-2022	DRAFT - UPDATE GATE, TREES AND DUNES CUT DOWN	
B	03-03-2022	DRAFT - GAS PIPELINE AND BOUNDARY UPDATED	
A	28-01-2022	DRAFT	

PROJECT NAME

GANESIS - FOXTON - 39.5MWp NEW ZEALAND

OWNER'S ENGINEER

GENERAL CONTRACTOR

AQUILA CAPITAL — GENERATING ESSENTIAL INVESTMENTS

Aquila Capital Renewables Asia Pte. Ltd.
138 Market Street #15-03 CapitaGreen
Singapore 048946 www.aquila-capital.com

TITLE: MODULE GENERAL ARRANGEMENT LAYOUT

DRAWING No: ACRA-NZ-GS-FXN-001

SHEET SIZE	SHEET	SCALE	
A1	1 OF 1	1:3500	C

Horowhenua DISTRICT COUNCIL

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SECTION 95E(3), RESOURCE MANAGEMENT ACT 1991

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Signature/s [redacted]

Date 23/5/22 Contact Phone _____ E-Mail _____

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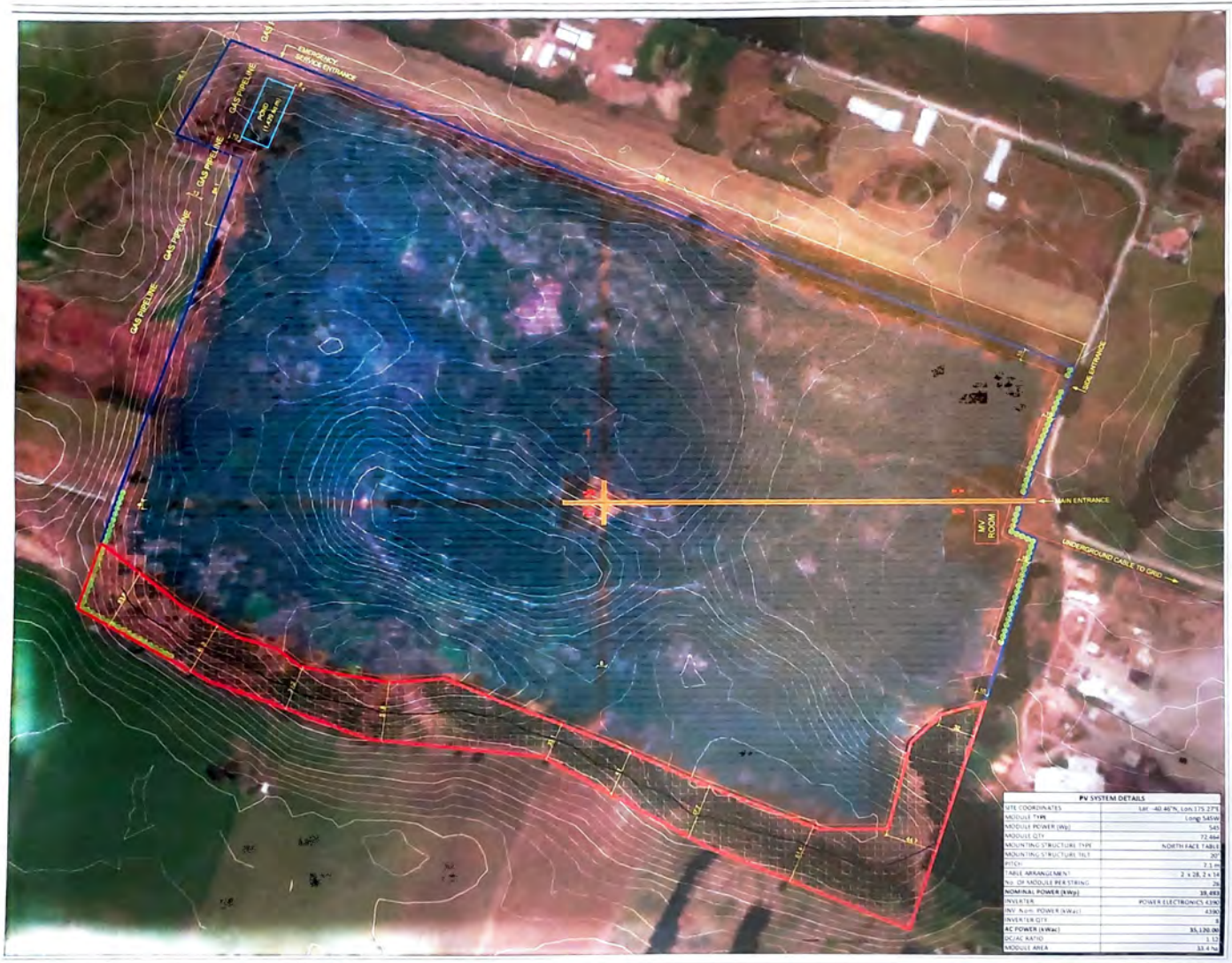

PRELIMINARY DESIGN

GENERAL NOTES

1. MODULE TYPE: 545Wp
2. TOTAL QUANTITY: 72,664 Nos
3. TOTAL POWER: 39,493 kWp
4. 2 x 28, 2 x 14 MODULE TABLE
5. 28 MODULE PER STRING
6. TILT ANGLE: 20° PITCH: 7.1 m
7. TOTAL MODULE AREA: 223,946 sq. m (55.3 Ac)
8. ALL DIMENSIONS ARE IN METER UNLESS OTHERWISE SPECIFIED
9. FINAL LAYOUT WILL BE DETERMINED AFTER SITE SURVEY

NORTH FACE TABLE OPTION
LR 545Wp MODULE

LEGEND

SITE BOUNDARY
PLANT ROAD
PV MODULE LONG SCAPE (2 x 28 MODULE FIELD IN FACE TABLE)
PV MODULE LONG SCAPE (2 x 14 MODULE FIELD IN FACE TABLE)
MAIN INVERTER STATION
FENCE
GAS PIPELINE
TREES

REFERENCE DRAWINGS

No	DRAWING TITLE	DRAWING No

No	DATE	DESCRIPTION OF REVISION	REMARKS
D	10-05-2022	DRAFT - UPDATE DUNES CLEARANCE AT SOUTH SIDE	
C	03-05-2022	DRAFT - UPDATE GATE, TREES AND DUNES CUT DOWN	
B	29-04-2022	DRAFT - GAS PIPELINE AND BOUNDARY UPDATED	
A	25-04-2022	DRAFT	

PROJECT NAME

GANESIS - FOXTON - 39.5MWp
NEW ZEALAND

OWNER'S ENGINEER

GENERAL CONTRACTOR

PV SYSTEM DETAILS

SITE COORDINATES	Lat -40.46°S, Lon 175.27°E
MODULE TYPE	Long 545w
MODULE POWER (Wp)	545
MODULE QTY	72,664
MOUNTING STRUCTURE TYPE	NORTH FACE TABLE
MOUNTING STRUCTURE TILT	20°
PITCH	7.1 m
TABLE ARRANGEMENT	2 x 28, 2 x 14
NO. OF MODULE PER STRING	28
NOMINAL POWER (kWp)	39,493
INVERTER	POWER ELECTRONICS 4.0kW
INV. Nom. POWER (kWac)	4.0kW
INVERTER QTY	8
AC POWER (kWac)	35,120.00
DC/AC RATIO	1.12
MODULE AREA	55.4 Ac

AQUILA CAPITAL — GENERATING ESSENTIAL INVESTMENTS

Aquila Capital Renewables Asia Pte. Ltd.
138 Market Street #19-03 CapitaGreen
Singapore 048946 www.aquila-capital.com

TITLE

MODULE GENERAL ARRANGEMENT LAYOUT

ACRA-NZ-GS-FXN-001

SHEET SIZE	SHEET	SCALE	REV.
A1	1 OF 1	1:3800	0

Horowhenua DISTRICT COUNCIL

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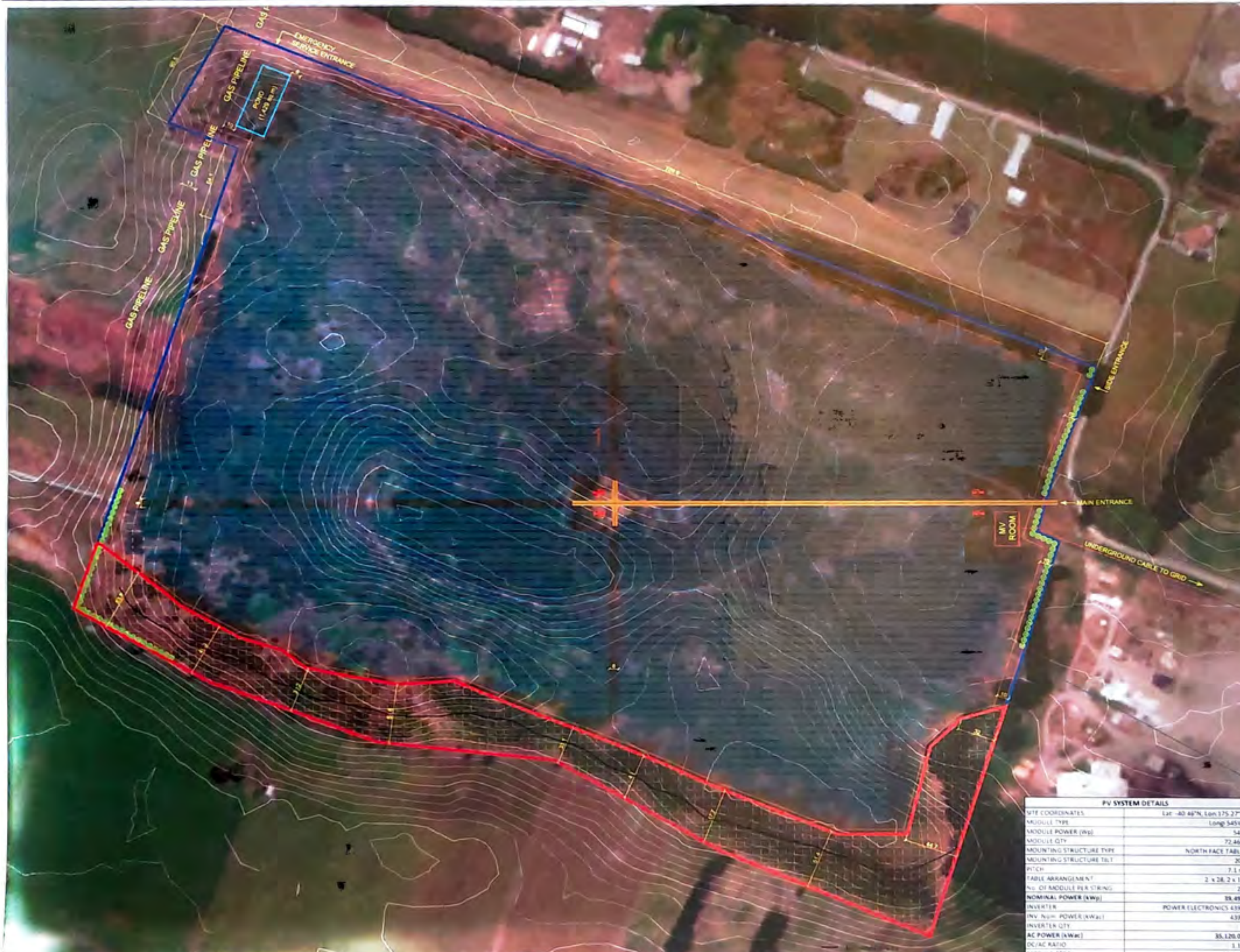

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MODULE QTY	72,464
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INVERTER	POWER ELECTRONICS 4390
INV. Nom. POWER (kWac)	4390
INVERTER QTY	8
AC POWER (kWac)	**35,120.00**
DC/AC RATIO	1.12
MODULE AREA	33.4 Ha

N E S

GENERAL NOTES

1. MODULE TYPE: 545Wp
2. TOTAL QUANTITY [illegible]
3. TOTAL POWER [illegible]
4. 2 x 28, 2 x 14 MODULE TABLE
5. 28 MODULE PER STRING
6. TILT ANGLE 20°, PITCH [illegible]
7. TOTAL MODULE AREA [illegible]
8. ALL DIMENSIONS ARE IN METER UNLESS OTHERWISE SPECIFIED
9. FINAL LAYOUT WILL BE DETERMINED AFTER SITE SURVEY

NORTH FACE TABLE OPTION LR 545Wp MODULE

LEGEND

- SITE BOUNDARY
- PLANT ROAD
- PV MODULE [illegible]
- PV MODULE [illegible]
- TWIN INVERTER STATION
- RAMPART
- GAS PIPELINE
- TREES

REFERENCE DRAWINGS

No.	DRAWING TITLE	DRAWING No.

N	DATE	DESCRIPTION OF REVISION	REMARKS
D	[illegible]	DRAFT - UPDATE DUNES CLEARANCE AT SOUTH SIDE	
C	[illegible]	DRAFT - UPDATE SATE, TREES AND DUNES CUT DOWN	
B	[illegible]	DRAFT - GAS PIPELINE AND BOUNDARY UPDATED	
A	[illegible]	DRAFT	

PROJECT NAME

GANESIS - FOXTON - 39.5MWp NEW ZEALAND

OWNER'S ENGINEER

GENERAL CONTRACTOR

AQUILA CAPITAL — GENERATING ESSENTIAL INVESTMENTS

Aquila Capital Renewables Asia Pte. Ltd.
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TITLE: **MODULE GENERAL ARRANGEMENT LAYOUT**

DRAWING No: **ACRA-NZ-GS-FXN-001**

SHEET SIZE	SHEET	SCALE	REV
A1	1 OF 1	1:3500	D

Horowhenua DISTRICT COUNCIL

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Signature/s [redacted]

Date 12/5/22 Contact Phone [redacted]

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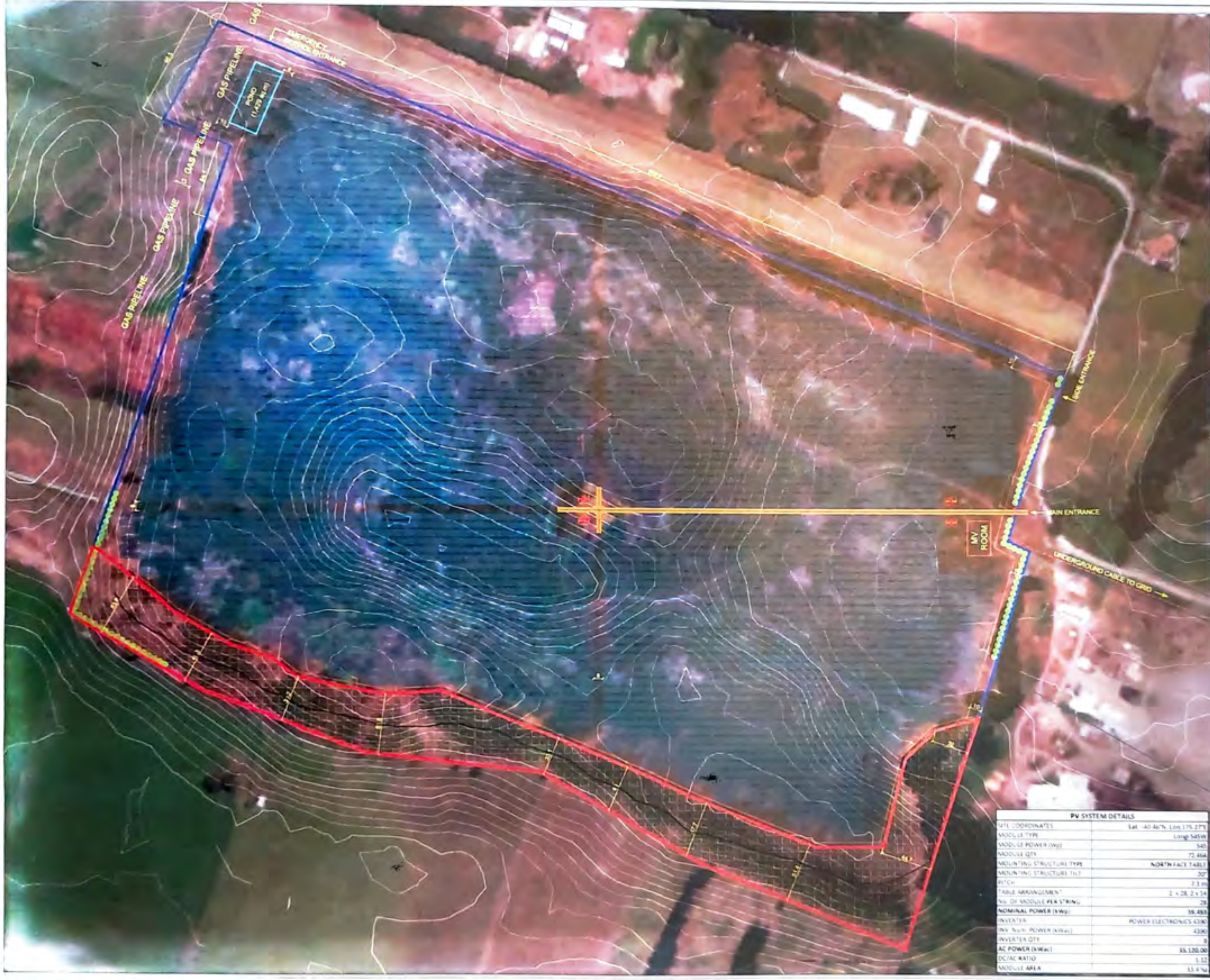

PV SYSTEM DETAILS	
SITE COORDINATES	Lat. -40.46°N, Lon.175.27°E
MODULE TYPE	Longi 545W
MODULE POWER (Wp)	545
MODULE QTY	72,464
MOUNTING STRUCTURE TYPE	NORTH FACE TABLE
MOUNTING STRUCTURE TILT	20°
PITCH	7.1 m
TABLE ARRANGEMENT	2 x 28, 2 x 14
No. OF MODULE PER STRING	28
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INVERTER	POWER ELECTRONICS 4390
INV. Nom. POWER (kWac)	4390
INVERTER QTY	8
AC POWER (kWac)	35,120.00
DC/AC RATIO	1.12
MODULE AREA	33.4 ha

PRELIMINARY DESIGN

GENERAL NOTES

1. MODULE TYPE: 545Wp
2. TOTAL QUANTITY 72,464 Nos
3. TOTAL POWER 39,493 kWp
4. 2 x 28, 2 x 14 MODULE TABLE
5. 28 MODULE PER STRING
6. TILT ANGLE 20°, PITCH 7.1 m
7. TOTAL MODULE AREA [illegible] (33.4 ha)
8. ALL DIMENSIONS ARE IN METER UNLESS OTHERWISE SPECIFIED
9. FINAL LAYOUT WILL BE DETERMINED AFTER SITE SURVEY

NORTH FACE TABLE OPTION
LR 545Wp MODULE

LEGEND

- SITE BOUNDARY
- PLANT ROAD
- PV MODULE (LONGI SOLAR 545Wp) 2 x 28 MODULE FIELD N-FACE TABLE
- PV MODULE (LONGI SOLAR 545Wp) 2 x 14 MODULE FIELD N-FACE TABLE
- TWIN INVERTER STATION
- RAMPART
- GAS PIPELINE
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REFERENCE DRAWINGS

No	DRAWING TITLE	DRAWING No

#	DATE	DESCRIPTION OF REVISION	REMARKS
D	19-05-2022	DRAFT - UPDATE DUNES CLEARANCE AT SOUTH SIDE	
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NEW ZEALAND

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TITLE: **MODULE GENERAL ARRANGEMENT LAYOUT**

DRAWING No: ACRA-NZ-GS-FXN-001

SHEET SIZE	SHEET	SCALE	REV
A1	1 OF 1	1:3500	D

Horowhenua DISTRICT COUNCIL

AFFECTED PERSON'S WRITTEN APPROVAL TO AN ACTIVITY THAT IS THE SUBJECT OF A RESOURCE CONSENT APPLICATION
SECTION 95E(3), RESOURCE MANAGEMENT ACT 1991

TO BE COMPLETED BY THE APPLICANT REQUESTING APPROVAL

Full Name(s) Far North Solar Farm Limited

Site Address Bergin Road, Foxton, adjacent to Fox Pine airfield Legal Description Lot 3 and 4 on DP 27011 and Lot 7 on DP 68629

Description of Proposal Solar Farm
Solar farm providing local power for approx. 5000 homes.

Shown on Plans Site plan attached

NOTES TO APPLICANTS:
- It is very important an accurate description of the activity is stated including all non compliances.
- All owners of this property must sign the approval form and sign a copy of any plans accompanying the application.

TO BE COMPLETED BY THE PERSON(S) PROVIDING THEIR WRITTEN APPROVAL

I/We (name/s) [redacted]

Of (address) [redacted]

☑ I am/~~we are~~ the OWNER(S) & OCCUPIER(S)/~~OWNERS/OCCUPIERS~~ (delete two) of the property.

☑ I/~~we~~ have read the full application for resource consent, the Assessment of Environmental Effects and signed each page of the plans.

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Signature/s [redacted]

Date 12/5/22 Contact Ph[redacted]

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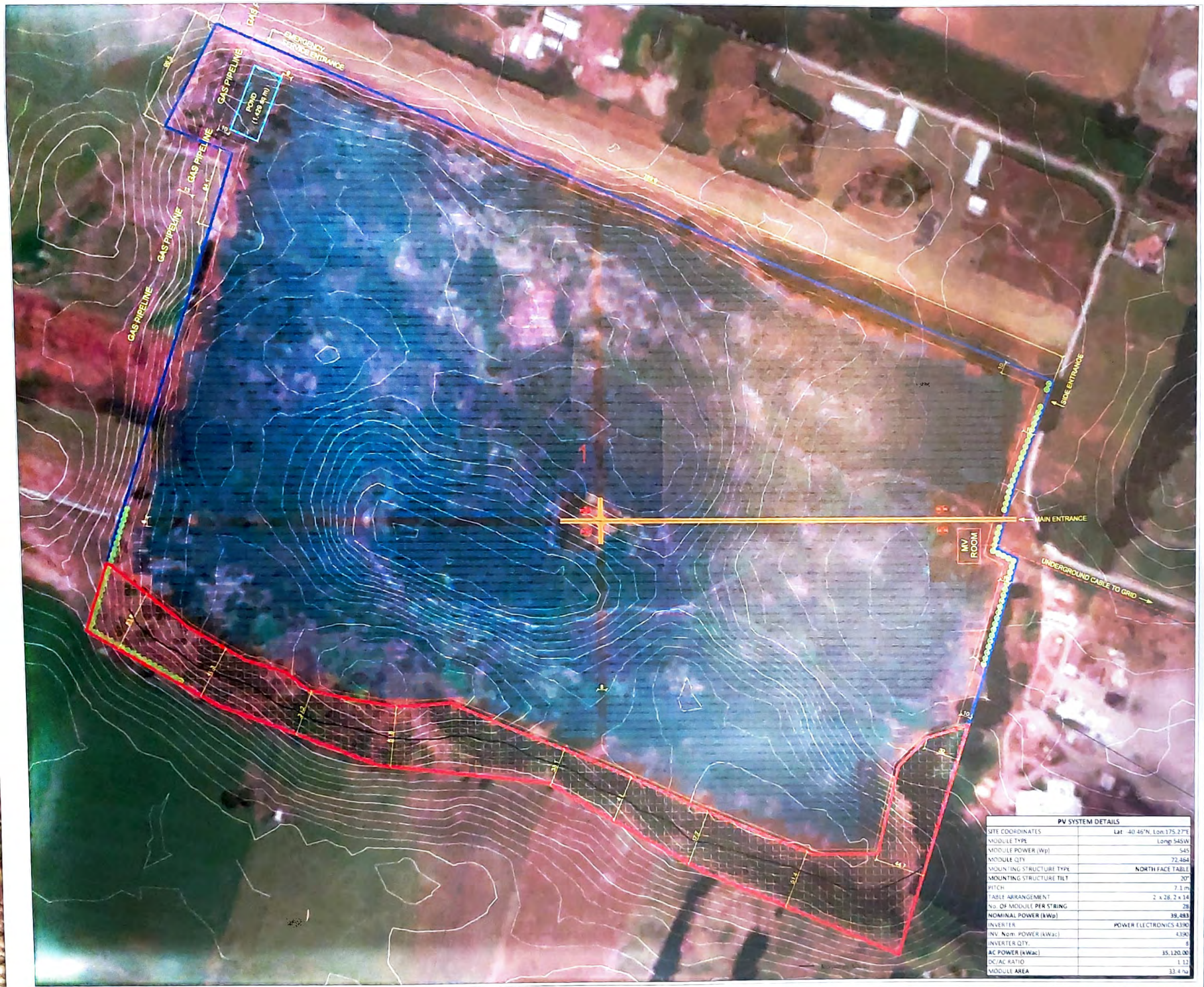

PRELIMINARY DESIGN

N E S

GENERAL NOTES

1. MODULE TYPE: 545Wp
2. TOTAL QUANTITY: 72,464 nos
3. TOTAL POWER: 39,493 kWp
4. 2 x 28, 2 x 14 MODULE TABLE
5. 28 MODULE PER STRING
6. TILT ANGLE: 20°, PITCH: 7.1 m
7. TOTAL MODULE AREA: 333,695 sq.m. (33.4 Ha)
8. ALL DIMENSIONS ARE IN METER UNLESS OTHERWISE SPECIFIED
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NORTH FACE TABLE OPTION
LR 545Wp MODULE

LEGEND

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- GAS PIPELINE
- TREES

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No.	DRAWING TITLE	DRAWING No.

R	DATE	DESCRIPTION OF REVISION	REMARKS
D	19-05-2022	DRAFT - UPDATE DUNES CLEARANCE AT SOUTH SIDE	
C	05-05-2022	DRAFT - UPDATE GATE, TREES AND DUNES OUT DOWN	
B	03-03-2022	DRAFT - GAS PIPELINE AND BOUNDARY UPDATED	
A	28-01-2022	DRAFT	

PROJECT NAME

GANESIS - FOXTON - 39.5MWp
NEW ZEALAND

OWNER'S ENGINEER

GENERAL CONTRACTOR

AQUILA CAPITAL — GENERATING ESSENTIAL INVESTMENTS

Aquila Capital Renewables Asia Pte. Ltd.
138 Market Street #15-03 CapitaGreen
Singapore 048946 www.aquila-capital.com

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Signature/s [redacted]

Date 14/6/22 Contact Phon [redacted]

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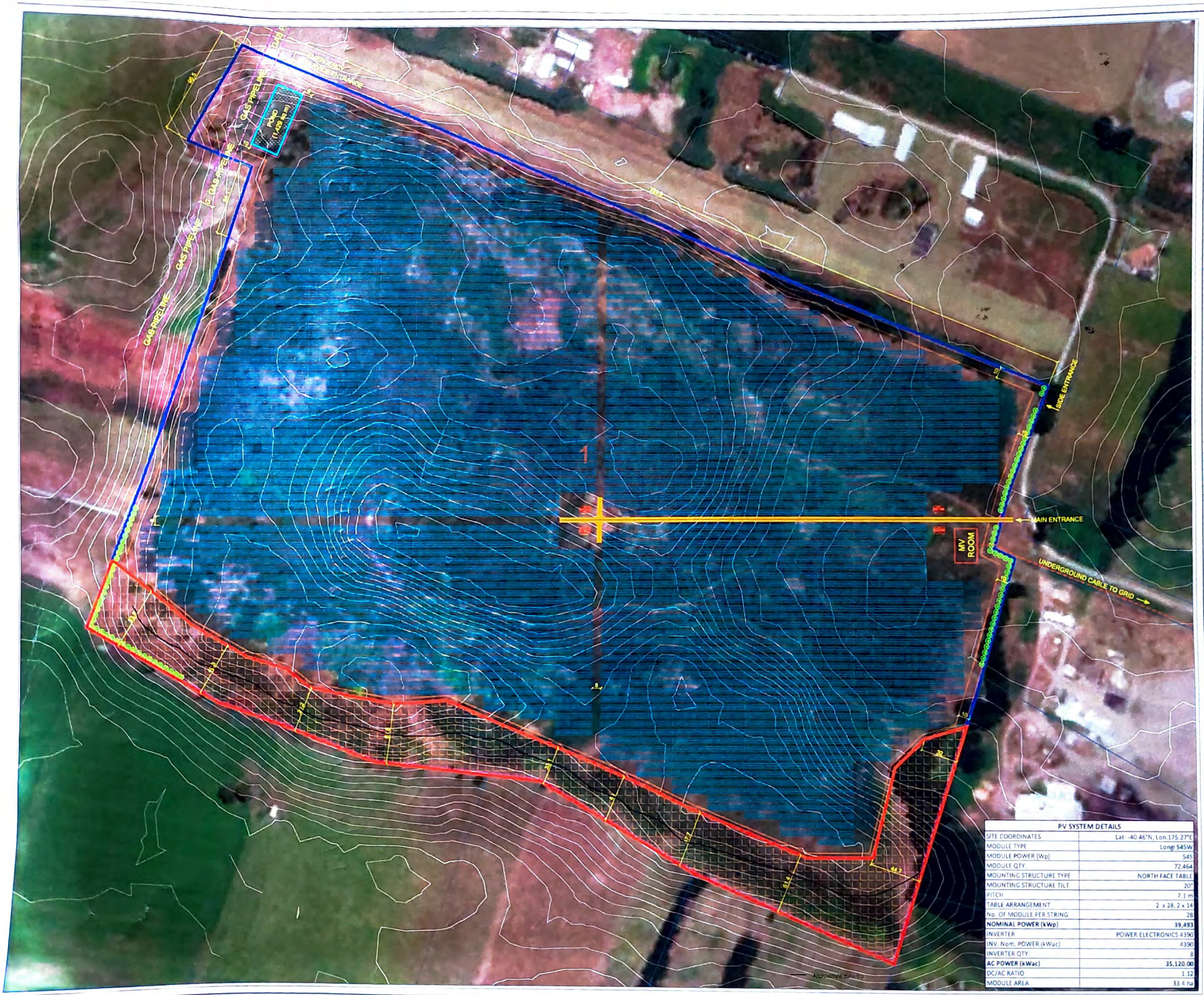

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A	28-01-2022	DRAFT	

PROJECT NAME

GANESIS - FOXTON - 39.5MWp
NEW ZEALAND

OWNER'S ENGINEER

GENERAL CONTRACTOR

PV SYSTEM DETAILS	
SITE COORDINATES	Lat: -40.46°N, Lon.175.27°E
MODULE TYPE	Longi 545W
MODULE POWER (Wp)	545
MODULE QTY.	72,464
MOUNTING STRUCTURE TYPE	NORTH FACE TABLE
MOUNTING STRUCTURE TILT	20°
PITCH	7.1 m
TABLE ARRANGEMENT	2 x 28, 2 x 14
No. OF MODULE PER STRING	28
NOMINAL POWER (kWp)	**39,493**
INVERTER	POWER ELECTRONICS 4390
INV. Nom. POWER (kWac)	4390
INVERTER QTY.	8
AC POWER (kWac)	**35,120.00**
DC/AC RATIO	1.12
MODULE AREA	33.4 ha

AQUILA CAPITAL — GENERATING ESSENTIAL INVESTMENTS

Aquila Capital Renewables Asia Pte. Ltd.
138 Market Street #15-03 CapitaGreen
Singapore 048946 www.aquila-capital.com

DRAWN BY / DATE	HAR. 10-05-2022	SIGN	HS
CHECKED BY / DATE	NKA. 10-05-2022		KM
APPROVED BY / DATE	TMO. 10-05-2022		TK

TITLE: MODULE GENERAL ARRANGEMENT LAYOUT

DRAWING No.: ACRA-NZ-GS-FXN-001

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Signature/s [redacted]

Date 14-6-22 Contact Phone [redacted] E-Mail [redacted]

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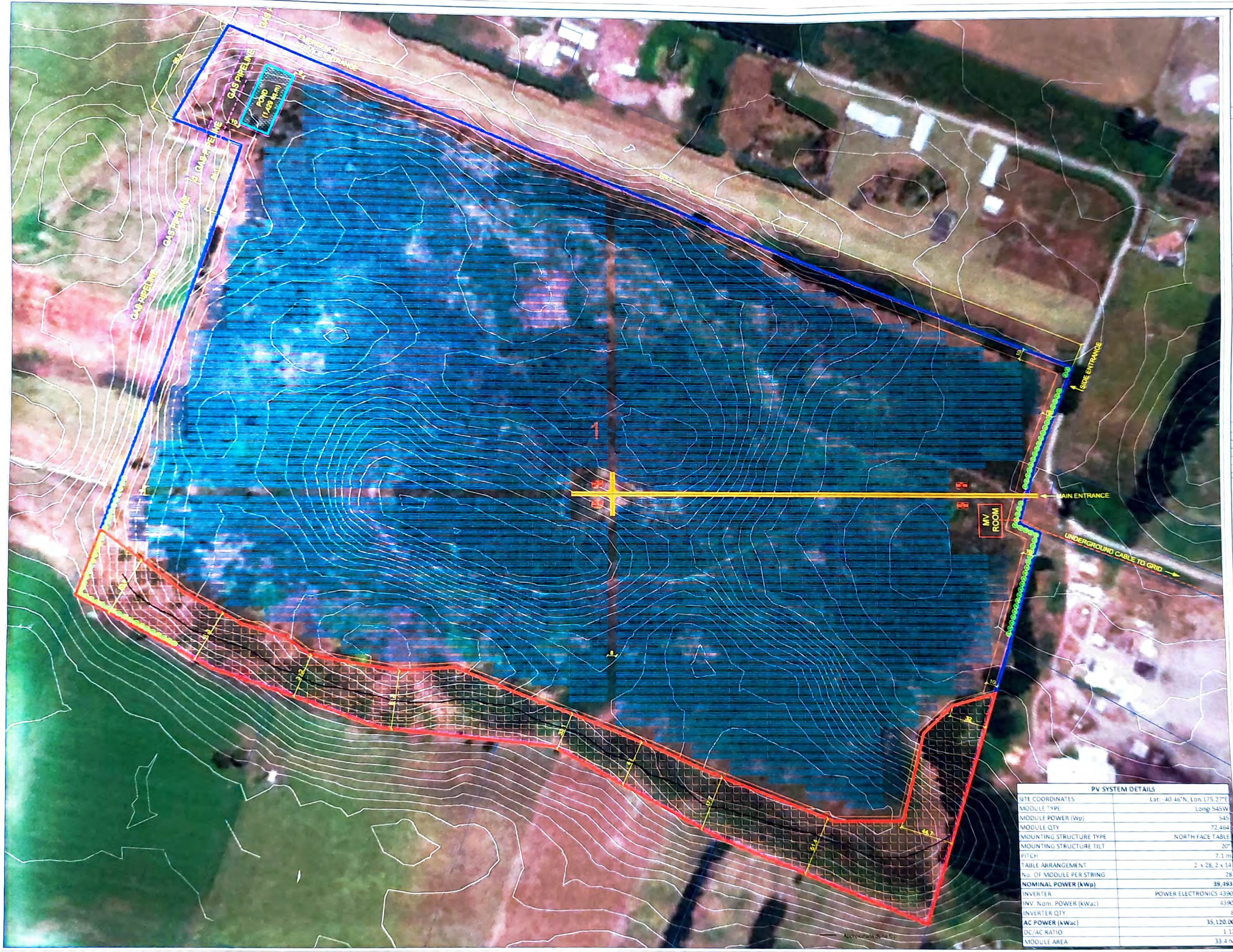

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GANESIS - FOXTON - 39.5MWp
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		SIGN	
DRAWN BY / DATE	HARI / 10-05-2022	H.S.	TITLE: MODULE GENERAL ARRANGEMENT LAYOUT
CHECKED BY / DATE	ARUL / 10-05-2022	A.M.	
APPROVED BY / DATE	TIMO / 10-05-2022	T.K.	

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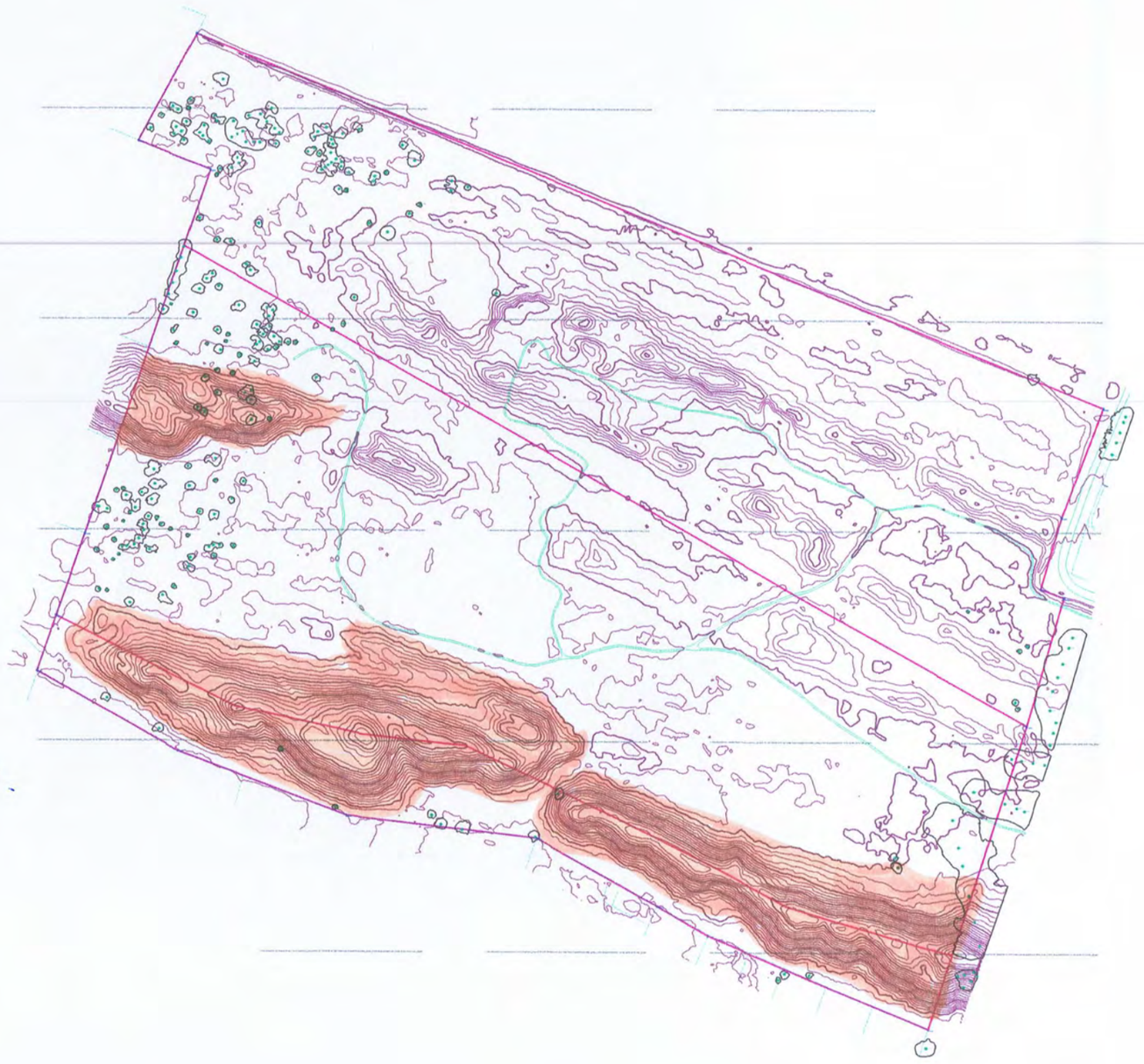


DUNES TO REMAIN.

Resource Consent Application - Form 9

Submission date:	**14 April 2022, 5:26PM**
Receipt number:	**RCA-128**
Related form version:	**5**

Before you begin, please note...

This form will guide you through applying for a Resource Consent under the Resource Management Act 1991 (RMA).

To ensure you have everything you need, we strongly recommend you read through our Applicant's Information Checklist first.

Make sure you fill in the form in full. If we need to request more information from you it may cause delays in the processing of your application.

Payment of application fee

The initial fee payment is a deposit only. If payment isn't made we may stop processing your application until it's received.

Additional charges will be made for the processing of your application, based on an hourly rate set out in our Planning Fees & Charges. These will be invoiced once your application has been completed.

Charges for Streamlined Housing Process applications will be capped at $4,500.

If you need assistance with your application, please contact Council via enquiries@horowhenua.govt.nz or 06 366 0999.

This form provides Council with your contact details, and details about your proposed activity. Note that all the information provided in your application is available to the public.

Information you'll need

Please check that you have:

Type of Resource Consent

Type of Resource Consent(s) sought: **Land use**

Resource Consent Deposit	**$1500.00**

1. Applicant Contact Details

Please Note:

- Should any of these details change, at any time, please notify us as soon as possible.
- For individuals, you must provide the full names of all individuals. For companies and other incorporated entities you must provide the company name, registration number and registered office details. You must also provide the name of a person or persons who will represent your company and be responsible for the consent. We will not accept applications made in the name of unregistered companies.
- For partnerships or unincorporated entities (such as private or family trusts or unincorporated bodies or societies) we must have the details of all authorised partners, trustees or members. We may also request a copy of your society's rules to verify your status as a formal body or society. Any consent granted will then include these names (where needed), and all individuals will be legally responsible for the consent and any associated costs. Should these persons, or their contact details change, then you must notify us.

Full name(s) of applicant: This is the name(s) that the consent will be issued to. Please provide the full name of the persons, company, society or trust applying for this resource consent. If the applicant is a trust, please provide the full name(s) of all trustees of that trust.	**Far North Solar Farm Limited**
Company / Organisation: (If applicable)	**Far North Solar Farm Limited**
Company registration number:	
Applicant's postal address: (or alternative method of service under section 352 of the RMA)	[redacted]
Applicant's residential address: If different from postal address above	[redacted]
Applicant's phone number (home):	
Applicant's phone number (business):	
Applicant's phone number (mobile):	[redacted]
Name of contact person: (If different from the applicant)	**Emily Burns, The Catalyst Group**

Email Address: A copy of your submitted details will be sent to the email address provided below	[redacted]
Preferred address for service:	**Email (Council's preferred correspondence option)**

2. Consultant / Agent details

Name / Company name:	**The Catalyst Group**
Contact person:	**Emily Burns**
Postal address: (or alternative method of service under section 352 of the RMA)	**Level 3/31 George Street, Palmerston North Central, Palmerston North 4410**
Email Address:	[redacted]
Phone number (home):	
Phone number (mobile):	[redacted]
Phone number (business):	

Partnership / unincorporated entity details (if applicable)

Note to Applicant: If necessary, please attach evidence of all further partners/trustees/members.

Name of first person:	
Status of first person: (Eg 'partner' or 'trustee')	
Residential address of first person: Enter the address, including the postcode	
Name of second person:	
Status of second person: (eg 'partner' or 'trustee')	
Residential address of second person:	
Evidence of all further partners / trustees / members:	

Who should we send application correspondence to?	**Consultant / Agent**
Preferred address for service:	**Email (Council's preferred correspondence option)**
Preferred address for invoicing:	**Email (Council's preferred correspondence option)**

Note to Applicant: All further costs will be invoiced directly to the Applicant unless otherwise specified.

Declaration:	**As the Consultant / Agent, I'm authorised to sign this form on behalf of the applicant.**

3. Location of Proposal

Physical address:	**Bergin Road, Foxton, 4814**
Legal description: This can be found on your Rates Invoice, eg Lot 1 DP 12345	**Lot 3-4 Deposited Plan 27011 and Lot 7 Deposited Plan 68629**
Valuation number(s):	
Map reference:	
Locality description: Include the name of any relevant stream, river or other water body to which the application may relate, and proximity to any well-known landmark(s) etc.	**Please see Section …. Of the AEE report for a description of the proposal.**
Photo or plan of the site location:	**Foxton Solar Farm Site Plan.pdf**
Is the activity in a coastal marine area? (As defined by the RMA 1991)	**No**
Is this property subject to inundation? You can find out if Horizons Regional Council has identified your property as being subject to inundation on their Flood plain mapping page.	**No**
Advice received from Horizons Regional Council regarding inundation and your proposal:	

4. Owner / Occupier of Site Details

Are the landowner details the same as the applicant details:	**No**
Landowner's full name, phone number and address:	**Levin Logging Company Limited, Colbert Cooper Ltd, 275 Oxford Street, Levin, 5510**
Are the occupier details the same as the applicant details:	**No**
Occupier's full name, phone number and address:	**Levin Logging Company Limited, Colbert Cooper Ltd, 275 Oxford Street, Levin, 5510**

5. Description of Proposed Activity

Describe the proposed activity of the application: Please describe and discuss the proposed activity in detail and the reasons why resource consent is required, ie which rule(s) in the Horowhenua District Plan are infringed and the specific degree to which the proposal breaches the rule(s). Alternatively you can upload a separate document below.	**Please see Section 2 of the AEE report for a description of the proposal.**
Upload Proposed Activity Description:	
Streamlined Housing Process Application	
Activity status:	**Discretionary**

6. Other Consents or Activities

Please let us know of any other consents that you have applied for or know that you need to apply for related to this activity.

Select all that apply:	**Regional Council consent**
Resource consent number (if known):	
Regional Council consent number (if known):	***Please note a determination on consent will be driven by total earthworks volume.**
Type of Regional Council consent: Please select all that apply.	**Land use consent**

National Environmental Standards (NES)*

Notes to Applicant:

- Please let us know if you require consent under a National Environmental Standard. National Environmental Standards are regulatory documents that contain standards pertaining to certain matters, eg management of contaminated land, telecommunications.
- National environmental standards are regulations which prescribe technical standards, methods or requirement for land use and subdivision, use of the coastal marine area and beds of lakes and rivers, water take and use, discharges, or noise. They can also prescribe technical standards, methods or requirements for monitoring.

Is an NES applicable to this application?	**No**

Select which NES is applicable:

Please select all that apply.

Does the proposed site have, or has it had, an activity or industry described in the HAIL* undertaken on it: **HAIL stands for "Hazardous Activities and Industries List". It is a list published by the Ministry for the Environment and can viewed on the MfE's website. Please contact Council if you're unsure or wish to see a list of HAIL activities.*	**No**

Please describe other activities that are part of the proposal to which the application relates (if applicable):

Note to Applicant: For any permitted activities, please explain how the activity complies with the requirements, conditions and permissions for any Plan or regulation so that a resource consent is not required for that activity under section 87A(1) of the Resource Management Act.

7. Assessment of Proposal

Notes to Applicant:

- For your application to be considered, an AEE must be included. The AEE should discuss all the actual and potential effects on the environment arising from the proposal. The amount of detail provided must reflect the nature and scale of the effects. For example, if there are major effects arising from the proposal, a detailed analysis and discussion of these effects should be included in the AEE. It may require the provision of information from specific experts such as an acoustic consultant or traffic engineer. If the effects of the proposal are very minor then a less detailed AEE can be submitted.
- For more information see clauses 6 and 7 of the Fourth Schedule of the RMA which lists the matters to be covered in an AEE. Also, please refer to the assessment criteria contained within the Horowhenua District Plan that are specific to the type of application you applying for. These will help focus you on the types of effects that need to be addressed in your assessment. These criteria are identified in Section 25 of the Plan and are specific to both subdivision and land use applications.
- Further information relative to an AEE for both subdivision and land use applications is contained in Section 28 of the District Plan and Council's "Subdivision and Development Principles and Requirements 2012".
- If you have trouble compiling the information, or need some advice on aspects of your application, please consult Council's Duty Planner - a planner is always available to assist with planning enquiries to provide assistance.

Assessment of Environmental Affects (AEE): *Please provide an assessment of the activity's effects on the environment in accordance with Schedule 4 of the RMA.*	**An Assessment Of Environmental Effects for this proposal is provided below.**
Upload Streamlined Housing Process Application:	
Upload Assessment of Environmental Effects (AEE):	**Foxton Solar Farm AEE - 14-04.pdf**

The Resource Management Act 1991 requires this application to include an assessment of the proposed activity against the Operative District Plan. If you believe your proposal is inconsistent with the relevant policies and documents discussed, it is recommended you seek professional planning assistance to help you with your application.

Please provide any additional information that is required to be provided under the relevant matters of Part 2 of the RMA and any relevant provisions of a National Environmental Standard, regulations, National Policy Statement, Regional Policy Statement, Regional Plan and District Plan.

Assessment of Environmental Effects related to other compliance matters:

If you're applying for a Resource Consent under the Streamlined Housing Process, upload any additional documentation that forms part of your assessment of the proposed activity against other matters requiring consent, including matters and information required by the District Plan, the Regional Plan, the Resource Management Act 1991, or any regulations made under

THECATALYSTGROUP
planning and environment

INSTALLATION AND OPERATION OF A SOLAR FARM AT FOXTON

ASSESSMENT OF ENVIRONMENTAL EFFECTS

12 April 2022

USE OF THIS REPORT

This report has been prepared by The Catalyst Group at the request of our client for the purposes for which they intended. Where we have relied on information from external sources, we have referenced these sources as appropriate and assumed them to be accurate. If you are unsure about interpretation of the content of this report, or its use beyond that for which the client intended, please get in touch with us at enquiries@thecatalystgroup.co.nz

Please reference this report as:

Burns,E, Carlyon G, 2022 Installation and Operation of a Solar Farm at Foxton. The Catalyst Group Contract Report No. 2022/174 prepared for Far North Solar Farm Ltd.

PREPARED BY:

Emily Burns

.....

REVIEWED BY:

Greg Carlyon

.....

CONTRACT REPORT NO:

2022/174

.....

PREPARED FOR:

Far North Solar Farm Ltd

.....

ACKNOWLEDGEMENTS:

p. +64 6 358 6300

e. enquiries@thecatalystgroup.co.nz

a. Level 3, 31 George Street,
PO Box 362, Palmerston North

www.thecatalystgroup.co.nz

THECATALYSTGROUP
planning and environment

TABLE OF CONTENTS

Tables:

Figures:

1 INTRODUCTION

The proposed development to be undertaken by Far North Solar Farms (FNSF) consists of a photovoltaic solar farm next to Foxpine Airpark, Bergin Road, Foxton, 4814. The site has access to a substation at Union Street, which is 2.7km away in terms of cabling routes. The land is large enough to accommodate the farm and is situated in an industrialised area of the rural zone. It provides all the necessary attributes to be viable for solar generation.

Resource consent is required for use of the land and other activities that are to take place on site during construction.

Construction on the site is to begin in Q4, 2022 and the expected duration of construction will be 9 months.

1.1 Applicant Details

Applicant:
Far North Solar Farm Ltd

[redacted]

Site: Bergin Road, Foxton

1.2 Purpose of Report

This report has been prepared in accordance with Section 88 and the 4th Schedule of the Resource Management Act 1991 (RMA), including the preparation of an Assessment of Environmental Effects (AEE). The report is additional supporting information to Council's prescribed application form which is attached as Appendix A.

1.3 Relevant Planning Documents

The following statutory documents contain regulatory rules and standards which the FNSF Project will need to be reviewed against:

- The One Plan as amended in 2018 – Horizons Regional Council
- Horowhenua District Plan (2015)
- Resource Management (National Environmental Standards for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NESCS).
- The Resource Management Act 1991
- National Policy Statement for Renewable Energy Generation 2011 (NPSREG 2011);
- National Policy Statement for Freshwater Management 2020 (NPSFM 2020);

2 DESCRIPTION OF THE PROPOSAL

2.1 Site Description

The site lies on the outskirts of Foxton in a rural setting approximately 4.2km from Foxton Beach (see Figure 1). The site covers 35.4 Hectares, with 32.22 Hectares to be covered by the solar array. To the immediate North of the site is Foxpine Airpark along with industrial sites to the East and a residential setting to the Southeast. On the Northeast and Southern perimeters, the environment consists of agricultural land which is used for mainly arable purposes. A parabolic dune runs parallel to the Southern Boundary within the perimeter of the site. The site is accessed via a road leading West from Bergin Road.

Figure 1: Site of the proposed solar farm shown in the red polygon

2.1.1 Land Use

The site proposed for the Foxton Solar Farm is a remnant dune series which has been extensively modified over many decades. It is an unused site with vegetative cover predominantly made up of weed species, waste ground cover from the development of the adjacent airpark has been stockpiled on site. The site is periodically used by the community for access to the adjacent Foxton loop. There is currently no developed infrastructure of any type on site. The site is located within an environment with industrial and rural land use adjacent to the boundaries and residential land use within proximity. The site is located adjacent to a private right of way that serves the Foxton Airpark.

2.1.2 Property Details

Information on property details for the site as well as lot divisions can be seen in Table 1. Records for the titles can be seen in Appendix X

Table 1: Property details for solar farm, Foxton

Record of Title	Legal Description	Area (hectares)	Owner	Address
WN39A/818	Lot 3-4 Deposited Plan 27011	23.7095 ha more or less	Levin Logging Company Limited	Colbert Cooper Ltd, 275 Oxford Street, Levin, 5510
WN37A/738	Lot 7 Deposited Plan 68629	16.1800 ha more or less	Levin Logging Company Limited	Colbert Cooper Ltd, 275 Oxford Street, Levin, 5510

The site is technically owned by Levin Logging Co Ltd. There are no current resource or planning consents for the property. There are two easements for the property specifically for Lot 3-4 and Lot 7 as the property is constituted. These agreements exist between The Natural Gas Cooperation of New Zealand and Levin Logging Co Ltd for a gas pipeline running through the property. There are no other rights over the property.

Title Instruments:

Title instruments are evident on all Records of Title; however, none will be affected by the proposal so have not been specifically mentioned here.

2.1.3 Access

A private access track leads off Bergin Road and finishes at Foxpine Airpark. Access to the site will be via the privately owned road leading to Foxpine Park. An access road will be constructed near to the connection point on site for the purpose of maintenance. There is an access easement over land at Foxpine Airpark, which is currently used as an airfield. An electrical easement will be sought for this land as well in order to access the site from the last power pole. New peripheral roads will also be constructed within the site for operation and maintenance purposes.

2.1.4 Zoning and Overlays

The site falls in the rural zone and is directly adjacent to an industrial zone. A residential zone falls to the Southeast approximately 20m in distance from the site. There are no overlays on the site or significant heritage features. There is a moa hunter midden to the East of the site. The rural zone supports a number of primary production processes and is subject to varying land uses. As well as primary production, there is the requirement for these areas to provides for industries and utilities.

The area of the proposal falls within the coastal landscape of the Horowhenua District, being segregated from the rural plains setting by the Manawatu River which encloses the town of Foxton and Foxton Beach.

Below the site is the Foxton Loop formerly an oxbow in the Manawatu River. The flood hazard area for this loop extends to just below Foxton Beach Road.

2.2 General Layout Overview

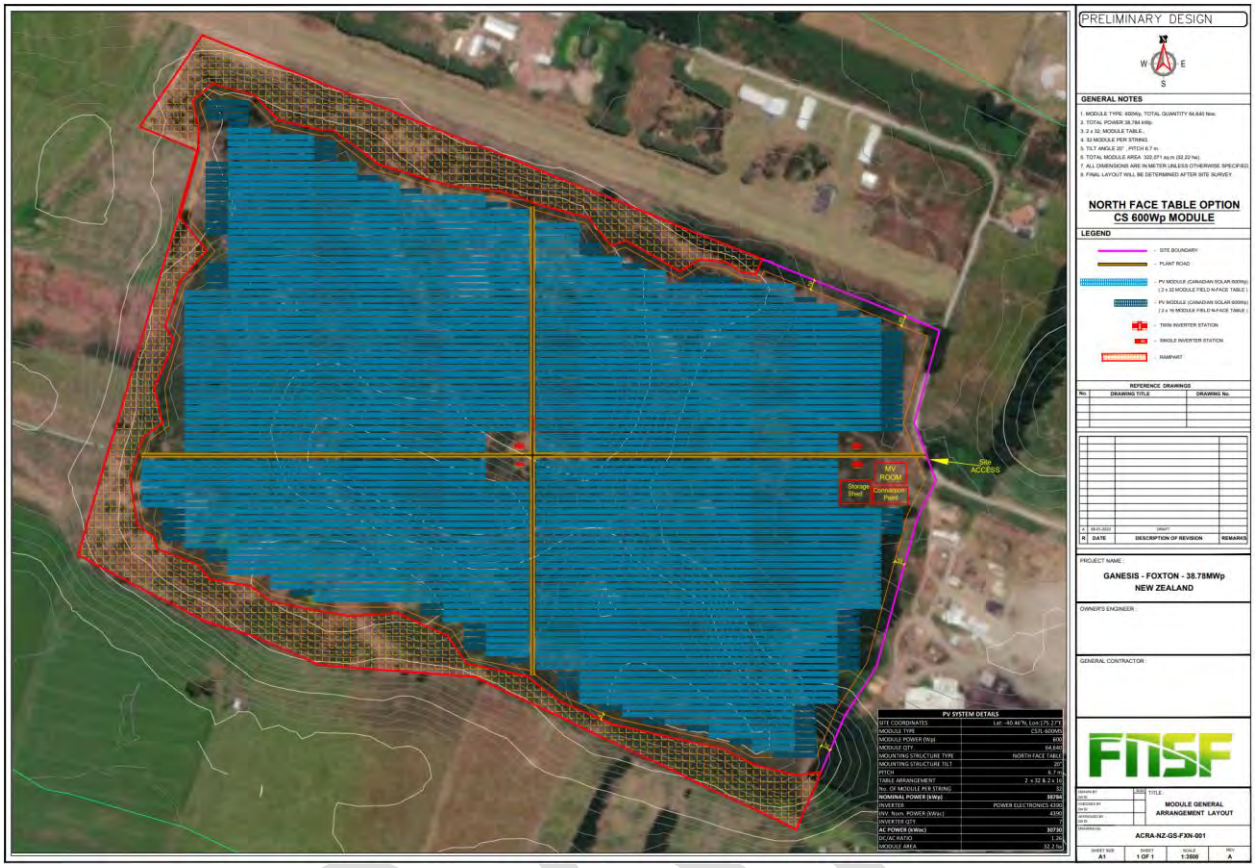


Figure 2: Drawing of Site Layout (Source: FNSF)

A conceptual drawing of the site overview can be seen in Figure 2. The site covers an area of 35.4 Hectares, with 32.22 Hectares to be covered by the solar PV modules and the rest to be covered by electrical equipment and stations, roadworks, a storage shed and cables. The storage shed will be primarily used for the metering and SCADA system as well as HV equipment. In total for the site, 444 arrays will be placed along with 6 or 7 Inverter Stations (MVPS) and 52,000 solar panels. Each inverter station will consist of 372 arrays of 128 panels and 72 arrays of 64 panels for a total of 102 combiner boxes.

The panels will be fixed tilt at 20 degrees facing North. Into each solar mounting structure two modules of 600Wp are vertically mounted with 64 and 32 modules per string tables. The gap between two tables will be 6.7m.

The total generation capacity of the of each inverter block will be 26.4 or 30.8 MW. An individual inverter block is rated at 4.4 MVA . The total solar capacity for the farm therefore equates to 31.334MWp using a 600-Watt panel. The site will also consist of an office, connection point and storage area to the East of the farm.

2.2.1 Landscape

The area is characteristic of undeveloped rural land. It consists of shrub and grassland dominated by weed species surrounded by pastoral farming land. There are access tracks running East to West through the site. To the North of the site is Foxpine Airpark, while the area adjacent to the site on the East side is used for

timber storage and automotive dismantling. The site is not an Outstanding Natural Landscape nor is it an Outstanding Natural Feature. There are no landscape features of significance in the vicinity of or on the site.

2.3 Site Preparation

There has been no earthworks or physical modification of the site undertaken by the applicant prior to consents being lodged. Vegetation clearance and earthworks will be required to provide a contour suitable for installation of the solar arrays. As identified in the AEE, the applicant intends to leave a margin on the Southern boundary by maintaining the bulk of the existing dune profile. The works required will result in soil disturbance across the bulk of the site and accordingly will require an earthworks and sediment control plan to avoid sediment losses from the site during the construction phase and manage windblow and dust.

The timing of the development is orientated around disturbance and stabilisation of the site (with grass cover) through the Spring period with infrastructure installation through the Summer period 2022/23. This activity will have no more than minor effects beyond the boundary with respect to impacts on the whenua.

2.4 Infrastructure Establishment

The mounting legs will be secured to concrete foundations placed over the topsoil. The legs for the mounts will be secured to the foundations. The panels will be supported on these legs and fixed at 20-degree tilt North.

Depiction of the Panel Arrangement

Figure 3: North facing mounting solar system (Source: https://solarbuildermag.com)

2.5 Operational Activities

There is minimal input required in terms of activity once the installation is operational. The activity will be self-sustaining apart from intermittent maintenance requirements.

The electrical components are small and quiet, requiring internal cooling fans. These will be situated away from the boundaries of the development to insure minimal noise pollution offsite. They will be fixed tilt and therefore they will not be moving.

2.6 Consideration Of Alternatives

Schedule 4 of the RMA requires that consideration of alternatives be given where it is likely that the activity will result in any significant adverse effect on the environment.

Far North Solar Farms has secured a number of sites for development through. The location determination is driven by key factors including sunshine hours, constructive joint venture arrangements with landowners and proximity to electricity reticulation infrastructure. Critical to the solar farms commitments to communities it is establishing in, is development of infrastructure with effects that are no more than minor on any assessment. Accordingly, the location of the Foxton Solar Farm has met these criteria with a joint venture with a community landowner, use of a currently degraded site, a respectful development in relation to adjacent landowners (rural, industrial, and residential) and location that will allow energy supply directly to the adjacent transmission network. On this basis alternatives have not been considered beyond the early site identification phase.

3 RESOURCE CONSENT REQUIREMENTS

An assessment of the relevant planning documents and associated rules can be viewed in Table 2.

Table 2: Planning Assessment for the Proposal

Rule and Relevant Document	Likely Overall Classification	Deciding Authorities	Comment
8(3) Disturbing Soils (NES 2011)	Not Applicable		Land has not had a Hazardous Activity of Industry List (HAIL) undertaken or currently being undertaken. No HAIL activity is known to exist.
National Environmental Standards for Freshwater 2020	Not Applicable		The proposal is not in the immediate vicinity of a watercourse, wetland, or lake. No resource consents for this proposal are triggered under these standards.
Horizons Regional Plan	Controlled	Manawatu/ Horowhenua Regional Council	The earthworks will be undertaken with an Erosion and Sediment Control Plan in place. The site is not within five metres of a waterbody or within 10m of a wetlands, trout spawning areas or aquatic sites of significance.
19.4.1 Any activity that is not a permitted, controlled, restricted discretionary, or non-complying activity is a discretionary activity. (HDP)	Discretionary	Horowhenua District Council	Renewable energy developments of this level of generation are not listed as permitted, controlled, or restricted discretionary.
19.4.6 Lines and support structures (including towers, masts, and poles) for conveying electricity at a voltage exceeding 110kV.	Discretionary	Horowhenua District Council	The installation will supply a total voltage of 31.334MW.
19.6.3 (b) No part of any other building shall exceed a height of 15m. (HDP)	Permitted	Horowhenua District Council	The storage building will be the only building on site, and this will not exceed 15m in height.

Rule and Relevant Document	Likely Overall Classification	Deciding Authorities	Comment
19.6.5 (a) All buildings shall comply with the following setbacks: (i) 10m from any District road boundary; (ii) 15m from any State Highway boundary; (iii) 10m from any other site boundary; (iv) 15m from any bank or stream edge; (v) 20m from the bed of any water body listed in Schedule 12 – Priority Water Bodies.	Permitted	Horowhenua District Council	The proposal meets these restrictions on setbacks. It is approximately 400m from the boundary of Bergin Road. The site is accessed via a private road. The site boundary is over 1km away from the State Highway 1. It is approximately 380m from the Foxton Loop Stream and over 3km away for the Manawatu River.
19.6.8 (a) Noise Levels – Noise from any activity shall not exceed given limits when measured at, or within, any point within any other site.	Permitted	Horowhenua District Council	Noise limits during operation for the site will adhere to limits best out in the rules for noise in the rural zone under the District Plan.
19.6.8 (b) Environmental noise.	Permitted	Horowhenua District Council	Operational noise will comply with the relevant daytime and night-time standards
19.6.8 (c) Noise during construction and maintenance.	Permitted	Horowhenua District Council	The proposal will adhere to the provisions for constructional noise laid out in NZS 6803:1999 Acoustics – Construction noise.
19.6.9 Vibration	Permitted	Horowhenua District Council	Vibration will be below permitted levels.
19.6.10 Odour	Permitted	Horowhenua District Council	This activity will not give rise to offensive or objectionable odours.

Rule and Relevant Document	Likely Overall Classification	Deciding Authorities	Comment
19.6.14 Sites of Significance to Tangata Whenua (a) No activity or development shall modify, demolish, or remove any site of significance to Māori where such site has been identified to Council and recorded by the Council in a register of sites prior to the time that any activity or development is proposed.	Permitted	Horowhenua District Council	There are no sites of significance to Tangata Whenua on land for the proposed development.
19.6.19 Surface water Disposal (a) All activities shall make provision for the management of stormwater as means of dealing with water quantity and water quality to avoid significant adverse effects or nuisance.	Permitted	Horowhenua District Council	Disposal of stormwater to be included in plan along with management plan for sediment and erosion.
19.6.21 Vehicle Access	Permitted	Horowhenua District Council	Access is provided via Bergin Road. A new access track will be constructed directly onto the site near the connection point. There will also be peripheral roads constructed on site.
19.6.22 Vehicle Parking, Manoeuvring, and Loading	Permitted	Horowhenua District Council	A parking and manoeuvring area is provided on site.
19.6.23 Safety and Visibility at Road and Rail Intersection	Permitted	Horowhenua District Council	The proposed development will not obscure the railway level crossing approach site triangles.
19.6.27 Notable Trees	Permitted	Horowhenua District Council	No notable trees in vicinity listed in Schedule 3 of the HDP.

3.1 Other Approvals

The Horowhenua District Plan has regard to Section 7 of the RMA which specifies the Councils must have particular regard to energy efficiency, climate, and the benefits of renewable energy. Under the NPS for renewable energy generation, the development of renewable energy facilities must be provided for as a matter of national significance. This proposal aligns with Policies 12.2.1, 12.2.4,12.2.5, 12.2.6, 12.2.7, 12.2.8, 12.2.9, 12.2.10 under Objective 12.2.1 of The District Plan for Energy.

3.1.1 Notification and Affected Persons

3.2 Notification Assessment

In the applicant's view notification of the application is not required on the basis that the applicant does not seek it and the assessment by consent authority has not occurred at this time (no determination available on notification). In addition, there are no circumstances that would require the application to be publicly notified and critically the effects assessment provided within the application identifies that the effects of the application will be no more than minor.

On this basis a determination not to publicly notify the application can be made.

3.3 Affected Persons Assessment

Schedule 4 of the RMA requires that an assessment of environmental effects identifies persons affected by an activity, any consultation undertaken, and any response to the views of any person consulted. While there is no requirement for an applicant to consult it is good practice and the principals of the project have engaged with the stakeholders who may be affected or interested in the project. A summary of that consultation is provided below.

For the purposes of determining who is adversely affected by a change of consent conditions, the Council must consider, in particular, every person who -

(a) made a submission on the original application; and

(b) may be affected by the change or cancellation.

Section 95E of the RMA therefore applies in determining whether a person is affected in a minor or more than minor, but not less than minor, manner.

In assessing an activity's adverse effects on a person, the Council shall apply the following methodology;

(a) may disregard an adverse effect of the activity on the person if a rule or a national environmental standard permits an activity with that effect; and

(b) must, if the activity is a controlled activity or a restricted discretionary activity, disregard an adverse effect of the activity on the person if the effect does not relate to a matter for which a rule or a national environmental standard reserves control or restricts discretion; and

(c) must have regard to every relevant statutory acknowledgement made in accordance with an Act specified in Schedule 11.

There are a number of standards that are not met by the application which result in the requirement for resource consents from the Horowhenua District Council and Manawatu/Whanganui Regional Council.

The councils will exclude consideration of effects associated with permitted activities and account for the affected party approvals and feedback from those who are potentially affected by the proposed land use and activities at site that provide for solar generation activities.

The most stringent activity classification is discretionary, however, this status appears to be largely driven by the lack of provision for renewable energy generation activities. The land use will be a new use of land within the rohe of Foxton, however the effects generated by the activity are no more than minor and will be present within the landscape, understood and can be readily avoided, remedied, or mitigated.

There are no statutory acknowledgements.

When assessing the effects on the environment and accounting for the interests of those adjacent to the site or potentially affected in the proximity no persons are considered to be affected in a minor or more than minor capacity.

Accordingly, it is appropriate that the application be considered on a non-notified basis.

4 ASSESSMENT OF ENVIRONMENTAL EFFECTS

4.1 Benefits of the Proposal

The objective of the National Policy Statement for Renewable Energy is:

> *"To recognise the national significance of renewable electricity generation activities by providing for the development, operation, maintenance and upgrading of new and existing renewable electricity generation activities, such that the proportion of New Zealand's electricity generated from renewable energy sources increases to a level that meets or exceeds the New Zealand Government's national target for renewable electricity generation."*

The propagation and development of solar energy farms contribute to a future in which New Zealand can provide for energy demands without adding to the global climate crisis. Central Government has issued a specific target of 90 per cent of electricity generated from renewable energy sources by 2025. This proposal will contribute to fulfilling this target.

The installation of a solar farm in the region would also align with Objective 3-2 of Horizon Regional Council's One Plan, which states the need for growth of renewable energy in the region.

With impacts of climate change comes pressures on our natural resources. Changes in weather patterns, rainfall and increased temperatures may increase the need for surface water abstraction. This in turn can limit the ability of hydroelectric dams to maintain the level needed for sufficient energy exchange. We have already

seen this in the increase in electricity prices here in Aotearoa. In order for Aotearoa to meet its target for 2025, renewable energy sources will need to be expanded and diversified nationally utilising suitable resources.

On a district level, the proposal will have positive effects on the community. The development will increase job availability and employment during the construction and installation phase. This will lead to the facilitation of electrical apprenticeships as part of the applicant's operations. It will also aid in meeting a skills shortage for solar farm electricians that will become ever more necessary in the future. The proposal will contribute to the sustainability and future productivity of the Horowhenua power network and create reliable generative capacity in the face of global change.

4.2 Effects on Broadcast, Radar and Navigation Sites and Facilities

North of the site is Foxpine Airpark, which specialises in microlight flying through a ground school and in-flight training. The runway runs parallel to the North boundary of the site (shown in Figure 1).

The federal aviation administration studies showed that due to the systems being low to the ground, it is extremely unlikely that they present a physical barrier to radar transmissions. The solar panels do not emit waves that could travel far enough to interfere with radar and any electrical equipment that can is buried beneath ground. This includes the inverters where the associated EMI fields would be at ground level or below. The proposed site for this solar farm is not located on the airfield and the airpark is a small site unlikely to contain powerful radar equipment.

4.3 Effects on Aircraft Safety

The effects of EMI on nearby aircraft operation have been assessed and has been determined to be low risk. To this end, Auckland international airport installed arrays on the roofs of Piers A and B in 2007.

There is little possibility of visual distraction or reflection in the path of an incoming or outgoing aircraft. Any glare observed by pilots on approach is thought to be akin to what they already experience from the likes of glass building and waterbodies (FAA,2021). This is due to the coating of the cells in order to minimise reflection. Instead of reflecting light back out to the atmosphere, the cells have internal etchings which increase absorption and the available light penetration to be converted to electrical energy.

4.4 Effects on Identified Sites of Significance to Tangata Whenua

There are no sites of significance to Tangata Whenua within the site or immediately surrounding the site according to the HDP. The Manawatu River used to follow the channel of the Foxton Loop to the South of the site, however the channel was diverted to allow direct flood flows to the ocean.

Consultation has been undertaken with tangata whenua.

4.5 Effects on Amenity

The development will be situated in a predominantly rural setting with fields to the North, South and West of the site. To the Southeast of the site is a residential area with industry adjacent to the Eastern boundary.

The site falls within a rural zone with immediate land surrounding the is subject to industrial development and agricultural processes. The environment direct adjacent to the site on the Western side is comprised of pastoral land which is actively farmed.

4.5.1 Rural Character

The landscape and natural character of a place or environment is determined by individual perspective and experience. The site is within a rural setting but has been subject to modification and industrial influence in the immediate vicinity. The values of the area and the attributes that give rise to the perceived human experience are described in the landscape report attached at Appendix... The impacts on the character of the site, whether they be moderately permanent, semi-permanent or transient, are assessed in the Landscape Report. These are summarised in the following sections.

Transient Experiential Effects

Semi- Permanent/ Moderately Permanent Experiential Effects

4.5.2 Noise and Vibration

There are two forms of noise expected for the development: noise during construction and noise during operation. They are both assessed for their effects on the rural zone and receptors in the vicinity. It is important to note that once constructed the operation of the solar farm is passive in nature and any noise will be limited to staff on site undertaking minor maintenance which will produce noise at or below background levels of the adjacent properties.

Construction Noise

There will be a period of earthworks during the construction phase during which time heavy machinery will be onsite for the purpose of contouring the landscape. This will include excavators and dump trucks. The hours of operation for this activity will be limited to ensure potential noise issues for the nearby residential community avoided. In all other aspects noise activity will be not dissimilar to the background levels associated with permitted activities within the adjacent industrial zone, dairy farm, and airpark.

Fluctuating noise levels are identified by 'LAeq(t)' for 'equivalent' over a set time period of 15 minutes. 'LAFmax' is used to address short duration sounds while representing a maximum level of noise. Outside neighbouring buildings are subject to NZS 6803 limits. This equates to 1m from the facades and 1.2 to 1.5m above the relevant floor level.

The noise emitted during the construction period will fluctuate depending on the distance at which the noise is heard, and the equipment being used. Generally, noise emissions during this phase be between 75-80dB at

a distance of 50m. The power tools used to erect and assemble the arrays have a typical noise emission level of around 90dB.

The minimum distance to the nearest residential dwellings approximately 20m to the Southeast on Herrington Street.

In order to minimise the potential for actual or potential impacts of noise to be experienced within the vicinity of the site, the applicant will implement the following measures:

- Noise will be limited to discreet events rather one long continuous sound.
- The dune on the Southern boundary will be retained to act as a barrier to sound travelling off site.
- Distance from surroundings particularly residential settings will mean that the noise impacts are alleviated and diluted as opposed to those heard on site.
- Construction will take place during the daytime to avoid disturbance to the neighbourhood during usual habitable hours.
- Equipment will not be left idle for long periods of time, any equipment left standing will be turned off to minimise potential impacts of continuous noise on site.

Operational Noise

Operational noise from the proposed solar farm will not exceed limits set out in the District Plan for activities within the rural zone. The limits are as follows:

(i) On any day -
- 7.00am – 7.00pm: 55dB LAeq (15mins)
- 7.00pm – 10.00pm: 50B LAeq (15mins)
- 10.00pm – 7.00am: 40dB LAeq (15mins)
- 10.00pm – 7.00am: 65dB LAmax

The panels do not move and therefore noise from machinery hydraulics will not occur. No noise is anticipated from any structural movement once the proposal is in operation. There will be noise from the cooling fans accompanying the converter units. This will take the form of a low hum. The temperature variations will mean that the cooling units will emit varying levels of noise depending on the output. In Aotearoa, the climate is temperate therefore maximum output will likely never occur. The maximum sound pressure of 63 dBA is measured at a temperature of 60 degrees Celsius at a 10m distance. The units will be placed centrally within the site in order to maximise distance to residences in the area.

There is approximately 20m of separation distance between the site of the proposed solar farm and the nearest residential zone.

4.5.3 Light Glare

The solar panels are a maximum 2.29m at their highest point from existing ground-level. The cells are coated in low-reflectivity material to minimise reflection of light and are set at low angles to avoid adverse effects of glare offsite.

Dunes to the South of the property will avoid exposure to sensitive receiving environments surrounding the site.

4.6 Effective Siting of Infrastructure

There is a requirement to acknowledge the need for the solar farm to be a at a site that provides the necessary orientation as well as a lack of existing infrastructure that might interfere with the operation of the solar farm. Consideration has been given to other sites during initial investigation but this one has been selected for its proximity to a substation, a joint venture with community landowner and feedback from adjacent landowners. In addition, there is no requirement to stop an existing land use activity at the site as it is currently unutilised for any purpose (excluding informal public use to access other parts of Foxton).

4.7 Rural Access Requirements

The access route is currently via the private road leading to Foxpine Airpark. This leads of Bergin Road to the West. As stated, Foxpine Airpark do retain an access easement over this track. This route for accessing the site from the collector road will be used for the proposal. To gain access directly onto site to carry out maintenance and construction of the array a new road will be constructed next to the point of connection. This will be in conjunction will peripheral roads on site to gain vehicular access to the full extent of the farm. The traffic to and from site will consist of four utility vehicles daily parked within the site. These will be transporting personnel required to operate small diggers and install the arrays. An average of six truck deliveries is likely to occur over the course of the construction with up to two deliveries occurring on any one day. The materials for the fence, arrays, shed and fencing will be prefabricated therefore excessive material deliveries are not required. The delivery schedule will be dependent on the shipping times. Constraints surrounding delivery time from overseas and the ability to freight to the site will mean the delivery of materials will be intermittent over the course of construction.

4.8 Parking and Loading Space Design and Construction

A parking area will be provided on site near to the connection point. This will be gravel surface and will be sufficient in protecting the rural environment from impacts of vehicular use and the low volume of traffic on site negates the need for anything further such as two-coat seal.

As a result of loading and construction, impacts off site are not expected to be more than minor. The amenities surrounding the area immediately North and adjacent to the site are industrial in nature already. Any access roads within the site will be setback from the boundary to ensure a buffer zone is maintained. This will be in addition to the creation of screens on site and the retainment of a dune along the Southern boundary.

4.9 Adaptive Management

Adaptive management is required under case law when there is possibility that the effects of a proposal are uncertain and associated planning to avoid, remedy or mitigate such effects are uncertain by nature. Consent

conditions are used to reflect an adaptive management approach where immediate effects can be foreseen and planned for but will be managed as when they become apparent throughout the process.

This proposal does not require adaptive management as effects have been foreseen and are not uncertain so they can be planned for. In this respect the measures used to avoid, remedy, or mitigate the associated effects can be implemented with certainty.

4.10 Reverse Sensitivity Effects

The proposed solar farm will be able to operate with efficiency in the immediate vicinity of industrial and rural activities without the potential of reverse sensitivity effects.

5 STATUTORY CONSIDERATIONS

5.1 Part 2 Of The Resource Management Act (1991)

Schedule 4 requires that assessment be made against Part 2 of the RMA. – any relevant provisions of a document referred to in Section 104 (1) (b).

Part 2 Purpose – to promote sustainable management of natural and physical resources (overall of the RMA) Case law findings have directed that decision makers should now only have recourse to Part 2 of the RMA, including higher order policy documents, if it is determined that:

1. Any part or the whole of the relevant plan(s) are invalid;
2. The relevant plan(s) did not provide complete coverage of the Part 2 matters;
3. There is uncertainty of the meaning of provisions as they affect Part 2.

Decision makers need only to give due consideration to Part 2 of the RMA if such matters addressed have not already been covered in the relevant planning documents. The operative One Plan and Horowhenua District Plan are comprehensive documents providing certainty and coverage of the matters that need to be addressed for consideration of the application. There is no requirement to address Part 2 matters on that basis.

5.2 Section 104 (1) (B) of the RMA

Section 104 (1) (b) of the RMA specifies adherence to the relevant plans. These include:

(i) a national environmental standard;
(ii) other regulations;
(iii) a national policy statement;
(iv) a New Zealand coastal policy statement;
(v) a regional policy statement or proposed regional policy statement;
(vi) a plan or proposed plan;

5.3 National Environmental Standards

There are no National Environmental Standards applicable to this proposal.

5.3.1 Other Regulations

This proposal does not necessitate the review of any further regulations as they are not relevant and do not apply to the consent process.

5.3.2 National Policy Statements

NPSREG 2011

The NPSREG 2011 applies to renewable electricity generation activities at any scale, and covers the construction, operation, maintenance and upgrading of new and existing structures associated with renewable electricity generation. The NPS REG confirms that:

- renewable electricity generation, regardless of scale, makes a crucial contribution to the well-being of New Zealand, its people and the environment, and any reductions in existing REG will compromise achievement of the Government's renewable electricity target of 90% of electricity from renewable sources by 2025; and
- the development, operation, maintenance and upgrading of new and existing renewable electricity activities throughout New Zealand, and the associated benefits of REG, are matters of national significance.

The NPSREG 2011 contains one objective that states;

> To recognise the national significance of renewable electricity generation activities by providing for the development, operation, maintenance and upgrading of new and existing renewable electricity generation activities, such that the proportion of New Zealand's electricity generated from renewable energy sources increases to a level that meets or exceeds the New Zealand Government's national target for renewable electricity generation. Policies A, B, and C are of most relevance to this proposal. In accordance with the NPSREG 2011, the RPS, and WDP all give full effect to the NPSREG 2011. As such, a full assessment of the remainder of the relevant provisions of this document is not conducted at this point and are instead addressed in the following sections.

NPSFM 2020

The National Policy Statement for Freshwater Management emphasises the importance of prioritising the health of freshwater bodies above the health of people as well as their economic cultural wellbeing. This hierarchy is displayed in its overall objectives. The NPSFM requires local authorities to cohesively manage waterbodies to ensure they give effect to Te Mana O te Wai and ensure longevity of the resources in the face of climate change.

(1) Adopting an integrated approach, ki uta ki tai, as required by Te Mana o te Wai, requires that local authorities must:

(a) recognise the interconnectedness of the whole environment, from the mountains and lakes, down the rivers to hāpua (lagoons), wahapū (estuaries) and to the sea; and

(b) recognise interactions between freshwater, land, water bodies, ecosystems, and receiving environments; and

(b) manage freshwater, and land use and development, in catchments in an integrated and sustainable way to avoid, remedy, or mitigate adverse effects, including cumulative effects, on the health and well-being of water bodies, freshwater ecosystems, and receiving environments; and

(c) encourage the co-ordination and sequencing of regional or urban growth.

Throughout construction of the solar farm, storm run-off will be manged under the sediment and erosion plan. There will be no impact on water quality as a result of the works or operation of the site.

New Zealand Coastal Policy Statement

This proposal will not be sited in the vicinity of the coastal environment and is therefore not subject to the New Zealand Coastal Policy Statement.

5.3.3 Regional Policy Statement – the One Plan

Renewable energy infrastructure is recognised as being as a matter of national significance in the national policy statement for renewable energy. This is reiterated in the regional policy statement. Electricity is considered of necessary importance for the day-to-day living, livelihood, and transport. It is important to allow for new sites of electricity generation.

Renewable forms of energy are intended to make up 90% of New Zealand's electricity generation by 2025 if the Government target is to be met. In order for the region to contribute to this target in the face of climate change, available renewable resources in the region must be available for generative establishment where possible.

The regional Council has stated that to this effect it must recognise the need to provide for the development of renewable energy. In order to achieve this, the regional council has laid out provisions in The One Plan for the regulation of renewable energy ensuring the continuity in planning across the region. The relevant objectives and policies within The One Plan are assessed with regards to this proposal in Table 3.

Table 3: Assessment of the One Plan objectives and policies relevant to this proposal

Objective	Policy	Assessment
Objective 2-1 (a): To have regard to the mauri* of natural and physical resources^ to enable hapū* and iwi* to provide for their social, economic, and cultural wellbeing. (b) Kaitiakitanga^ must be given particular regard and the relationship of hapū* and iwi* with their ancestral lands^, water^, sites*, wāhi tapu* and other taonga* (including wāhi tūpuna*) must be recognised and provided for through resource management processes.	Policy 2-1: Hapū* and iwi* involvement in resource management – The Regional Council must foster kaitiakitanga^ and the relationship between hapū* and iwi* and their ancestral lands^, water^, sites*, wāhi tapu* and other taonga* (including wāhi tūpuna*) through increased involvement of hapū* and iwi* in resource management.	During assessment of environmental effects for this site, consultation with representative hapū has taken place. This has been done to recognise areas of significance to Iwi within the site of the proposal and have regard to areas of concern that arises from this.
Objective 3-2: Energy An improvement in the efficiency of the end use of energy and an increase in the use of renewable energy^ resources within the Region	Policy 3-6: Renewable energy^ (a) The Regional Council and Territorial Authorities^ must have particular regard to: (i) the benefits of the use and development of renewable energy^ resources including: (A) contributing to reduction in greenhouse gases, (B) reduced dependency on imported energy sources, Infrastructure, Energy, Waste*, Hazardous Substances* and Contaminated Land 3-8 One Plan - 2014 (C) reduced exposure to fossil fuel price volatility, and (D) security of supply for current and future generations, (ii) the Region's potential for the use and development of renewable energy^ resources, and (iii) the need for renewable energy^ activities to locate where the renewable energy^ resource is located, and (iv) the benefits of enabling the increased generation capacity and efficiency of existing renewable electricity generation facilities, and (v) the logistical or technical practicalities associated with developing, upgrading, operating or maintaining an established renewable	This proposal will increase efficiency of energy generation in the region and will lead to further energy security in the face of global shortages. The ability of the natural resources to generate further energy will be utilised and further enhance the ability of both the region and the country to develop greener energy strategies.

Objective	Policy	Assessment
	electricity generation activity. (b) The Regional Council and Territorial Authorities^ must generally not restrict the use of small domestic-scale renewable energy^ production for individual domestic use.	
Objective 3-1: Infrastructure^ and other physical resources of regional or national importance	Policy 3-1: Benefits of infrastructure^ and other physical resources of regional or national importance (i) facilities for the generation of more than 1 MW of electricity and its supporting infrastructure^ where the electricity generated is supplied to the electricity distribution and transmission networks	This proposal will generate more than 1 MW of electricity and will contribute to the local grid.
Objective 4-2: Regulating potential causes of accelerated erosion*	(a) In order to achieve Objective 4-2, the Regional Council must regulate vegetation clearance*, land disturbance*, forestry* and cultivation* through rules^ in this Plan and decisions on resource consents^, so as to minimise the risk of accelerated erosion, minimise discharges of sediment to water, and maintain the benefits of riparian vegetation for water bodies^. c) The Regional Council will generally allow small scale vegetation clearance*, land disturbance*, forestry* and cultivation* to be undertaken without the need for a resource consent^ if conditions^ are met. Vegetation clearance* and land disturbance* require a resource consent^ if they are undertaken adjacent to some water bodies^ (including certain wetlands^) in Hill Country Erosion Management Areas* or in coastal foredune* areas. Any other	The activity will be undertaken in accordance with a sediment and erosion control plan. Water quality in the area will not be impacted by discharge from the site. The site is not near any sites of significance or water in close proximity to waterbodies.

Objective	Policy	Assessment
	large scale land disturbance* will also require a resource consent^.	

5.3.4 Horowhenua District Plan

The district plan is required to align with the policies set out in The One Plan to avoid inconsistency with approach to natural resources across the region. The provisions laid out in the District Plan that are applicable to the proposal are addressed in Table 4.

Table 4: Assessment of Horowhenua District Council objectives and policies relevant to this proposal.

Objective 1.3.1 Sites of Cultural Significance To protect areas and sites of cultural significance, wāhi tapu, wāhi tūpuna and other taonga from the adverse effects of inappropriate subdivision, use, and development of resources.	
Policy 1.3.3 Avoid or appropriately mitigate any adverse effects of activities that could destroy or damage the cultural values associated with an area or site of cultural significance identified in the District Plan.	Throughout the consent process, consultation has been undertaken with Tāngata Whenua. In doing so, cultural values and areas of significance have been addressed.
Policy 1.3.5 Recognise and take into account any adverse effects which would degrade the cultural values of areas and sites of cultural significance, wāhi tapu, wāhi tūpuna and other taonga when assessing proposals for the subdivision, use and development of resources.	
Objective 2.4.1 Land Use Activities – Nature, Character, Amenity Values and Servicing To enable primary production activities and other rural based land uses to function efficiently and effectively in the Rural Zone, while avoiding, remedying, or mitigating the adverse effects of activities, including reverse sensitivity effects caused by new activities on existing activities, in a way that maintains and enhances the character and amenity values of the rural environment.	
Policy 2.4.4 Control and manage the establishment and operation of a range of other land use activities, including sensitive activities, in the rural environment to ensure their adverse effects on the environment (including reverse sensitivity effects on existing lawfully established activities) are avoided, remedied, or mitigated.	No adverse effects are expected as a result of this proposal. Earthworks will be manged under a sediment and erosion plan to ensure any discharge from site does not impact water quality in the area.
Policy 2.4.5 Manage any activity which does not meet minimum standards by assessing on a case-by case basis to ensure the adverse effects on the environment are avoided, remedied, or mitigated.	Effects of the proposal are assessed as being no more than minor. Any potential affects will be avoided, remedied, or mitigated.
Policy 2.4.7 Avoid, remedy, or mitigate the impact of buildings on the rural landscape and maintain overall low building density and building height throughout the rural environment.	Building height will be in keeping. The use of margin and vegetation screens will ensure the project is in keeping with industrialised rural surroundings.
Policy 2.4.10 Avoid, remedy, or mitigate adverse effects on rural privacy and rural character in the Rural Zone by maintaining road and site boundary setbacks	Site boundaries will be maintained throughout.

for all buildings, while recognising the degree of privacy and rural spaciousness is different in areas comprising existing smaller rural-residential lots	
Policy 2.4.13 Avoid, remedy, or mitigate any adverse effects upon residential properties or road safety caused by lighting or glare from any source.	The proposal will be set back from residential properties and a screen will surround the site to ensure landscape effects are avoided.
Policy 2.4.17 Maintain overall day and night-time noise conditions at levels compatible with the amenity and activity present in the rural environment	Noise levels will be in keeping with limits for the rural zone during operation.
Policy 2.4.18 Ensure that effects of increased traffic or changed traffic type or change to road access do not compromise the safe and efficient operation of any road or adversely affect the safe and convenient movement of people on public roads.	Traffic to and from site will be minimal and will compromise the safety of efficiency of surrounding road infrastructure.
Policy 2.4.19 Provide for a limited amount of signage located on the site to which the activity relates to minimise the effects on the rural environment.	Signage will be erected on site during and after construction.
Objective 12.2.1 Energy To recognise and provide for the efficient use of energy and the development and use of renewable electricity generation infrastructure, where the adverse effects on the environment can be avoided, remedied, or mitigated.	
Policy 12.2.4 Manage the establishment and development of new renewable electricity generation facilities to ensure the adverse environmental effects that are more than minor are avoided, remedied, or mitigated.	Effects of this proposal for solar energy generation will incur no more than minor effects. This has been assessed in detail in the AEE.
Policy 12.2.5 Recognise the contribution of renewable energy use and development to the well-being of the District, Region, and Nation.	In granting the proposal consent, energy efficiency in the district will be increased while adverse effects of this new infrastructure will be avoided.
Policy 12.2.6 Avoid, remedy, or mitigate adverse effects on the environment from renewable electricity generation and distribution activities, specifically on those parts of the environment most sensitive to change.	The site of the proposal is not highly modified already and is not considered a sensitive site for the sake of this application.
Policy 12.2.7 Manage effects of renewable electricity generation by: (a) avoiding significant adverse cumulative effects on the characteristics and values of Outstanding Natural Features and Landscapes; and (b) avoiding any other adverse effects of renewable electricity generation facilities on the characteristics and values of Outstanding Natural Features and Landscapes. Where avoidance is not reasonably practical, adverse effects need to be remedies or mitigated.	No outstanding natural features or landscapes will be impacted by the proposal.

Policy 12.2.8 Ensure development of renewable electricity generation facilities minimises visual interruption or intrusion of views of the Tararua Ranges when viewed from public spaces within the Levin urban area	Views of the Tararua Ranges will not be impacted by the proposal.
Policy 12.2.9 Recognise the technical, locational, and operational requirements of energy generation and distribution operations and infrastructure in setting environmental standards and assessing applications for resource consent.	As stated, the site selected for this proposal meets criteria for suitability and viability of solar generation. This is in conjunction with the industrial surroundings already in place and the modified nature of the land.
Policy 12.2.10 Provide for the identification and assessment by energy generators and developers, of potential sites and energy sources for renewable electricity generation.	This site has been identified and assessed as being viable for solar generation.

6 CONCLUSION

This application for resource consent in regard to installation and operation of a solar farm in Foxton is consistent with Section 4 and Section 104C of the RMA. Activities outlined within the proposal are restricted discretionary under the Horowhenua District Council Plan. The activities listed can be granted as the effects associated with them are assessed to be no less than minor. The proposal is consistent with the relevant policy documents outlined and there is no reason under Part 2 of The RMA as to why consent should not be granted.

APPENDIX

THECATALYSTGROUP

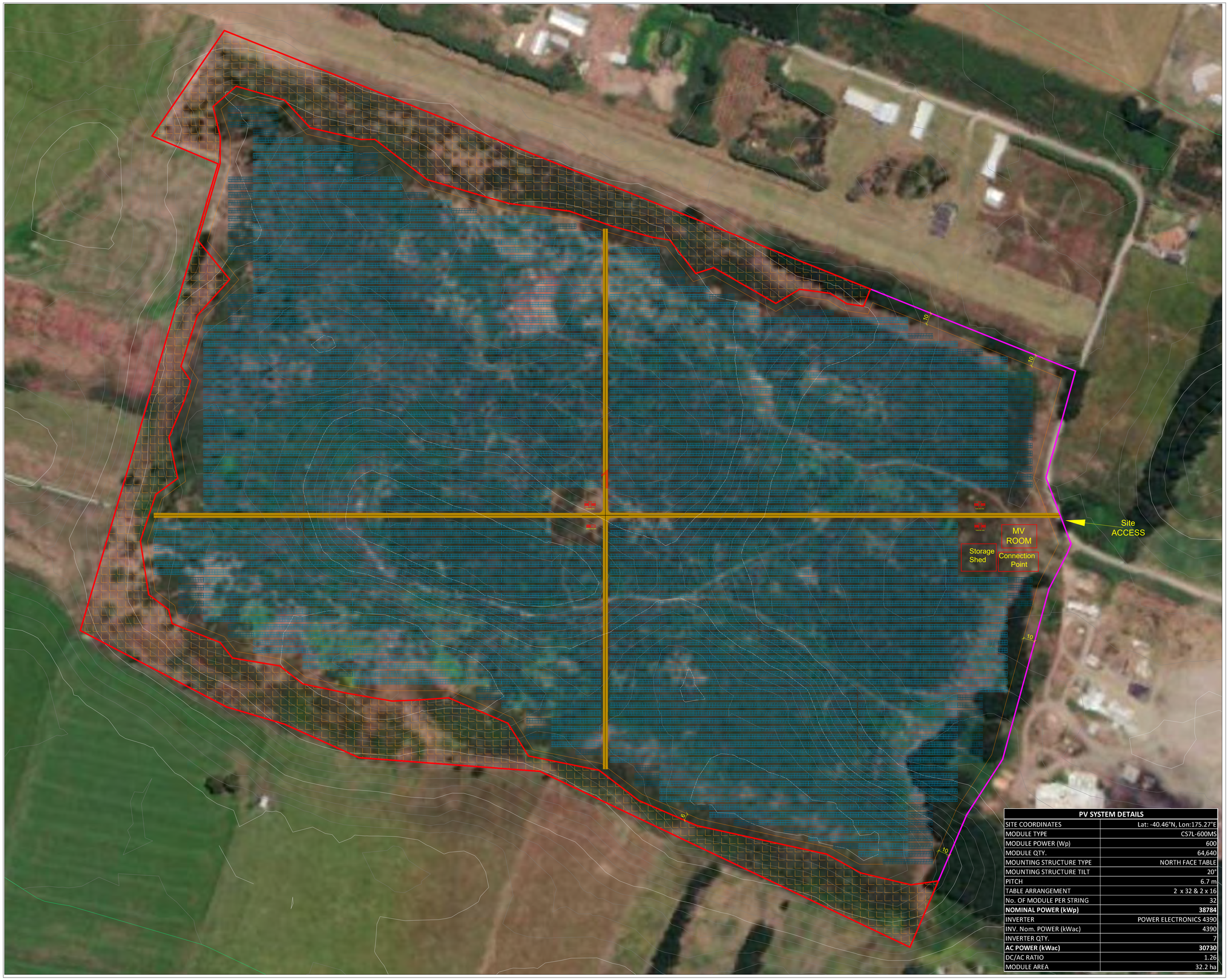
planning and environment

p. +64 6 358 6300

e. enquiries@thecatalystgroup.co.nz

a. Level 3, 31 George Street,
PO Box 362, Palmerston North

www.thecatalystgroup.co.nz



PV SYSTEM DETAILS	
SITE COORDINATES	Lat: -40.46°N, Lon:175.27°E
MODULE TYPE	CS7L-600MS
MODULE POWER (Wp)	600
MODULE QTY.	64,640
MOUNTING STRUCTURE TYPE	NORTH FACE TABLE
MOUNTING STRUCTURE TILT	20°
PITCH	6.7 m
TABLE ARRANGEMENT	2 x 32 & 2 x 16
No. OF MODULE PER STRING	32
NOMINAL POWER (kWp)	**38784**
INVERTER	POWER ELECTRONICS 4390
INV. Nom. POWER (kWac)	4390
INVERTER QTY.	7
AC POWER (kWac)	**30730**
DC/AC RATIO	1.26
MODULE AREA	32.2 ha

PRELIMINARY DESIGN

N
W E
S

GENERAL NOTES

1. MODULE TYPE: 600Wp, TOTAL QUANTITY 64,640 Nos.
2. TOTAL POWER 38,784 kWp.
3. 2 x 32, MODULE TABLE.,
4. 32 MODULE PER STRING.
5. TILT ANGLE 20° , PITCH 6.7 m.
6. TOTAL MODULE AREA 322,071 sq.m (32.22 ha).
7. ALL DIMENSIONS ARE IN METER UNLESS OTHERWISE SPECIFIED.
8. FINAL LAYOUT WILL BE DETERMINED AFTER SITE SURVEY.

NORTH FACE TABLE OPTION
CS 600Wp MODULE

LEGEND

- SITE BOUNDARY
- PLANT ROAD
- PV MODULE (CANADIAN SOLAR 600Wp) (2 x 32 MODULE FIELD N-FACE TABLE)
- PV MODULE (CANADIAN SOLAR 600Wp) (2 x 16 MODULE FIELD N-FACE TABLE)
- TWIN INVERTER STATION
- SINGLE INVERTER STATION
- RAMPART

REFERENCE DRAWINGS

No.	DRAWING TITLE	DRAWING No.

R	DATE	DESCRIPTION OF REVISION	REMARKS
A	28-01-2022	DRAFT	

PROJECT NAME :

GANESIS - FOXTON - 38.78MWp
NEW ZEALAND

OWNER'S ENGINEER :

GENERAL CONTRACTOR :

FTSF

DRAWN BY :
DATE :
CHECKED BY :
DATE :
APPROVED BY :
DATE :
SIGN

TITLE :

MODULE GENERAL ARRANGEMENT LAYOUT

DRAWING No.

ACRA-NZ-GS-FXN-001

SHEET SIZE	SHEET	SCALE	REV
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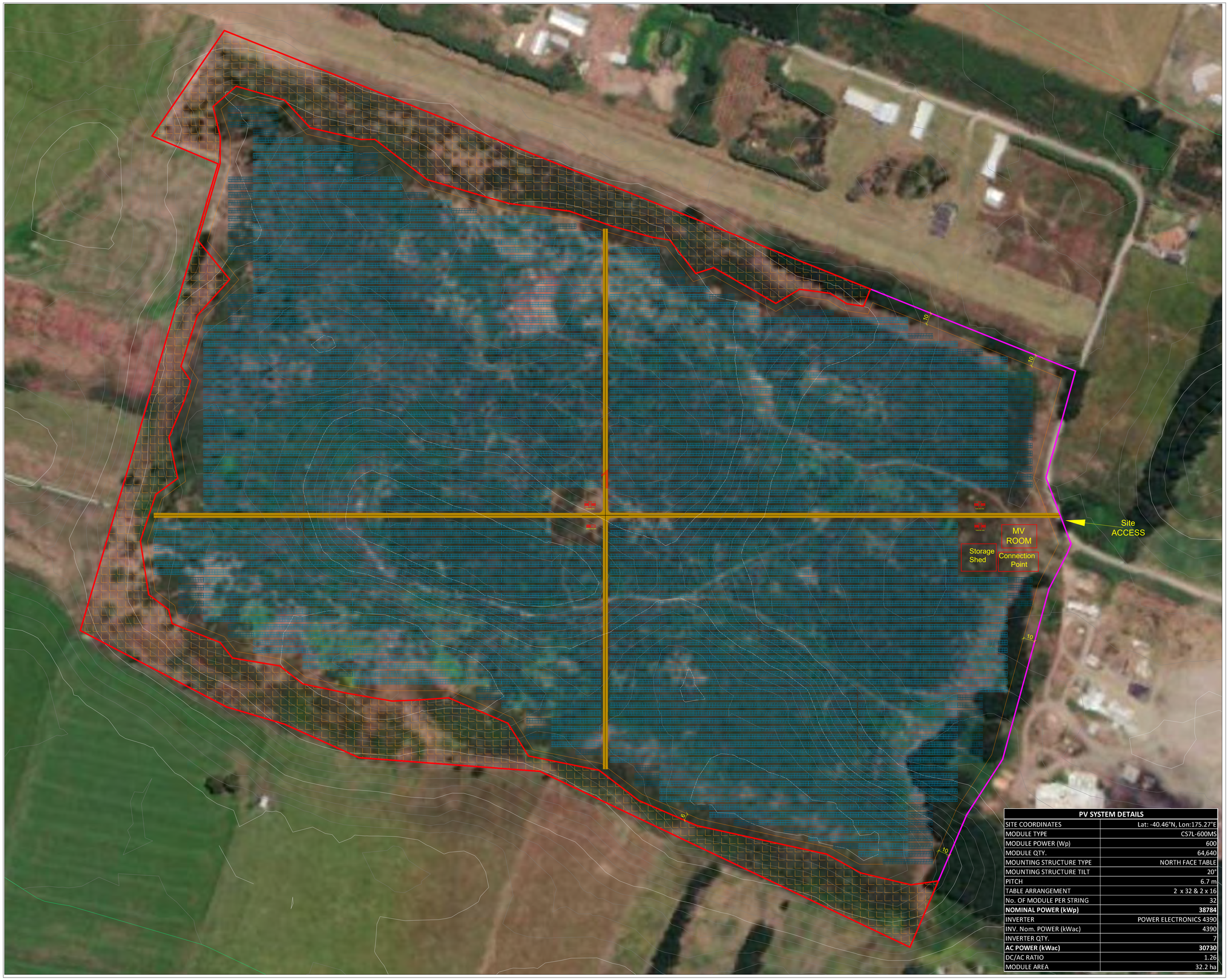

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CS 600Wp MODULE

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GANESIS - FOXTON - 38.78MWp
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OWNER'S ENGINEER :

GENERAL CONTRACTOR :

FTSF

DRAWN BY :
DATE :
CHECKED BY :
DATE :
APPROVED BY :
DATE :
SIGN

TITLE :

MODULE GENERAL ARRANGEMENT LAYOUT

DRAWING No.

ACRA-NZ-GS-FXN-001

SHEET SIZE	SHEET	SCALE	REV
A1	1 OF 1	1:3500	A

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Historical Search Copy

R.W. Muir
Registrar-General
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

Identifier **WN37A/738**

Land Registration District **Wellington**

Date Issued 06 September 1990

Prior References
WN17B/157

Estate Fee Simple

Area 16.1800 hectares more or less

Legal Description Lot 7 Deposited Plan 68629

Original Registered Owners
W. Crighton and Son Limited

Interests

972526.1 Variation of the conditions of the Pipeline easement specified in Certificate 753554

The within land has no frontage to a public road - See Certificate B106937.3

Subject to gas pipeline rights (in gross) over part marked D on DP 68629 in favour of The Natural Gas Corporation of New Zealand Limited as specified in Pipeline Easement Certificate 753554

Appurtenant hereto is a right of way specified in Easement Certificate B106937.5 - 6.9.1990 at 2.59 pm

The easements specified in Easement Certificate B106937.5 are subject to Section 309 (1) (a) Local Government Act 1974

9002109.1 Transfer to W Crighton and Son Limited - 26.4.2012 at 11:22 am

9172314.1 Notice pursuant to Section 195(2) Climate Change Response Act 2002 - 14.9.2012 at 12:18 pm

9196725.1 Mortgage to Bank of New Zealand - 28.9.2012 at 3:46 pm

10303086.1 Discharge of Mortgage 9196725.1 - 21.1.2016 at 10:05 am

10303086.2 Transfer to Levin Logging Co Limited - 21.1.2016 at 10:05 am

10415496.1 Cancellation of Notice 9172314.1 pursuant to Section 195(3) Climate Change Response Act 2002 - 29.4.2016 at 5:19 pm

References
Prior C/T 17B/157

Transfer No.
N/C. Order No. B.106937.4

Land and Deeds 69

REGISTER

No. 37A/738

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 6th day of September one thousand nine hundred and ninety under the seal of the District Land Registrar of the Land Registration District of WELLINGTON

WITNESSETH that OXNAM TIMBER & HARDWARE LIMITED at Foxton

is seised of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 16.1800 hectares more or less situate in the District of Manawatu being Lot 7 on Deposited Plan 68629

Assistant Land Registrar

The within land has no frontage to a Public Road - See Certificate B.106937.3.

A.L.R.

Subject to Gas pipeline rights (in gross) over the part herein marked "D" on DP 68629 in favour of The Natural Gas Corporation of New Zealand Limited - See Pipeline Easement Certificate 753554 and Variation of Pipeline Easement Certificate 972526.1

A.L.R.

B227593.1 929592.3 Mortgage to DFC Financial Services Limited - 27.6.1988 at 2.21 p.m. DISCHARGED 10.4.1992

A.L.R.

B.106937.5 Easement Certificate pursuant to Section 90A Land Transfer Act 1952

TENEMENTS: DP 68629

NATURE	SERVIENT	DOMINANT
Right of Way	Lot 6 "A"	Lot 7

- 6.9.1990 at 2.59 p.m. (Subject to Section 309(1)(a) Local Government Act 1974).

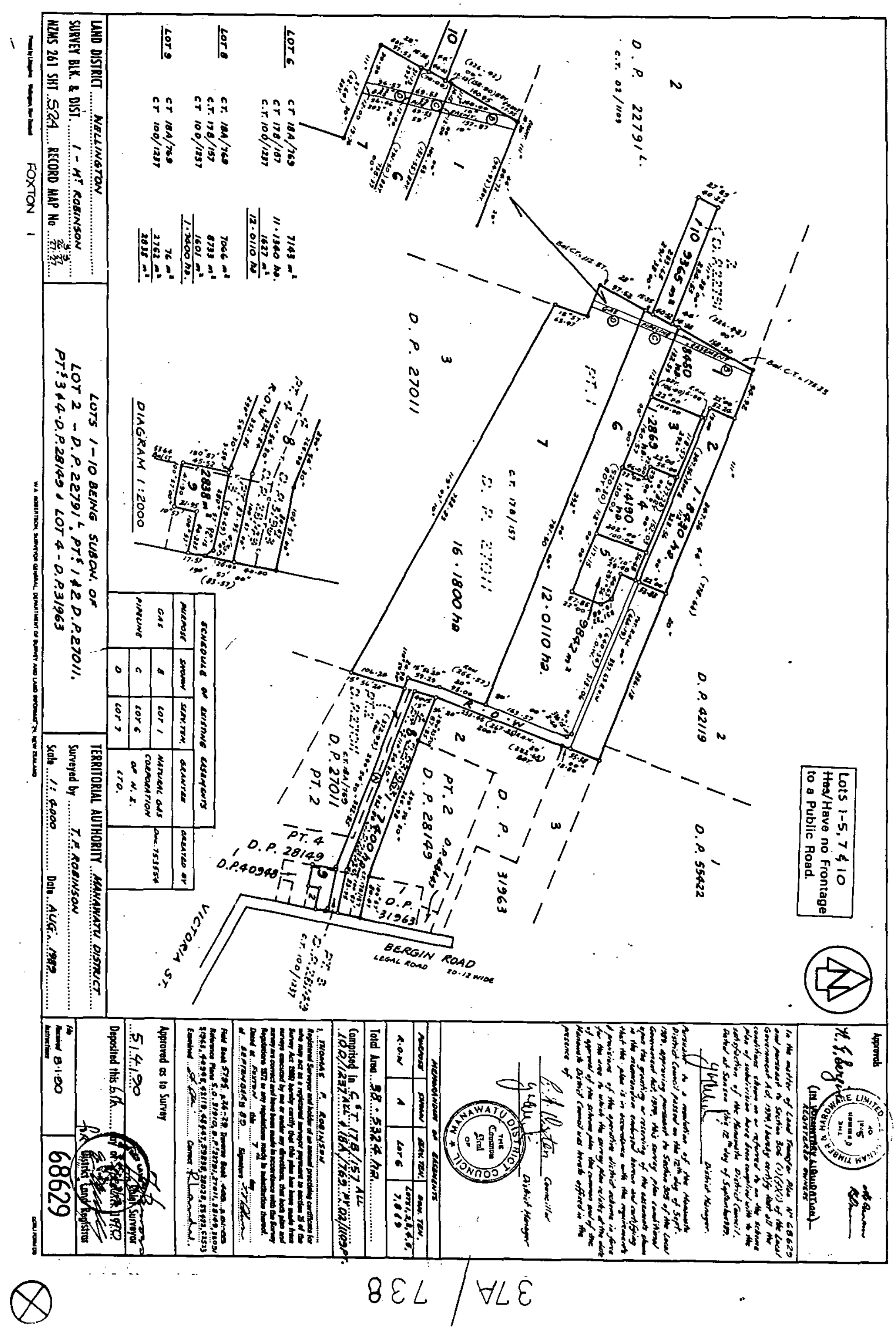
A.L.R.

B.227593.3 Transfer to W. Crighton and Son Limited at Levin - 10.4.1992 at 9.05 a.m.

A.L.R.

No. 37A/738

Measurements are Metric


LOTS 1-10 BEING SUBDN. OF
LOT 2 - D.P. 22791 L, PTS 1 & 2 D.P. 27011,
PT. 3 & 4 - D.P. 28149 & LOT 4 - D.P. 31963
DIAGRAM 1:2000
LAND DISTRICT WELLINGTON
TERRITORIAL AUTHORITY MANAWATU DISTRICT
Surveyed by T.P. ROBINSON
SCHEDULE OF EXISTING EASEMENTS
MEMORANDUM OF EASEMENTS
Lots 1-5, 7 & 10 Has/Have no Frontage to a Public Road.
D.P. 22791 L
D.P. 27011
D.P. 42119
D.P. 55422
D.P. 31963
D.P. 28149
D.P. 40948
BERGIN ROAD
VICTORIA ST.
FOXTON
68629
37A / 738

RECORD OF TITLE
UNDER LAND TRANSFER ACT 2017
FREEHOLD

Historical Search Copy

R.W. Muir
Registrar-General
of Land

Constituted as a Record of Title pursuant to Sections 7 and 12 of the Land Transfer Act 2017 - 12 November 2018

Identifier **WN39A/818**

Land Registration District **Wellington**

Date Issued 29 April 1991

Prior References
WN37A/743

Estate Fee Simple

Area 23.7095 hectares more or less

Legal Description Lot 3-4 Deposited Plan 27011

Original Registered Owners
W. Crighton and Son Limited

Interests

941248.1 Variation of Pipeline Easement Certificate 753554 - 17.8.1988 at 10.45 am

753554 Pipeline Certificate pursuant to Section 70 of the Petroleum Act 1937 over part marked B on DP 62522 in favour Natural Gas Corporation of New Zealand Limited - 6.8.1968 at 9.31 am (affects Lot 4)

9002109.1 Transfer to W Crighton and Son Limited - 26.4.2012 at 11:22 am

9172314.1 Notice pursuant to Section 195(2) Climate Change Response Act 2002 - 14.9.2012 at 12:18 pm

9196725.1 Mortgage to Bank of New Zealand - 28.9.2012 at 3:46 pm

10004973.1 Discharge of Mortgage 9196725.1 - 17.9.2015 at 2:58 pm

10004973.2 Transfer to Levin Logging Co Limited - 17.9.2015 at 2:58 pm

10415496.1 Cancellation of Notice 9172314.1 pursuant to Section 195(3) Climate Change Response Act 2002 - 29.4.2016 at 5:19 pm

References
Prior C/T 37A/743

Transfer No.
N/C. Order No. B.156718.1

Land and Deeds 69

REGISTER

No. 39A/818

CERTIFICATE OF TITLE UNDER LAND TRANSFER ACT

This Certificate dated the 29th day of April one thousand nine hundred and ninety-one under the seal of the District Land Registrar of the Land Registration District of WELLINGTON

WITNESSETH that **OXNAM TIMBER & HARDWARE LIMITED** at Foxton

is seised of an estate in fee-simple (subject to such reservations, restrictions, encumbrances, liens, and interests as are notified by memorial underwritten or endorsed hereon) in the land hereinafter described, delineated with bold black lines on the plan hereon, be the several admeasurements a little more or less, that is to say: All that parcel of land containing 23.7095 hectares more or less situate in the District of Horowhenua being Lots 3 and 4 on Deposited Plan 27011

Assistant Land Registrar

Interests at date of Issue:

1. 753554 Pipeline Easement Certificate under Section 70 Petroleum Act 1937 over the part Lot 4 herein marked "B" on DP 62522 in favour of Natural Gas Corporation of New Zealand Limited - 6.8.1968 at 9.31 a.m.

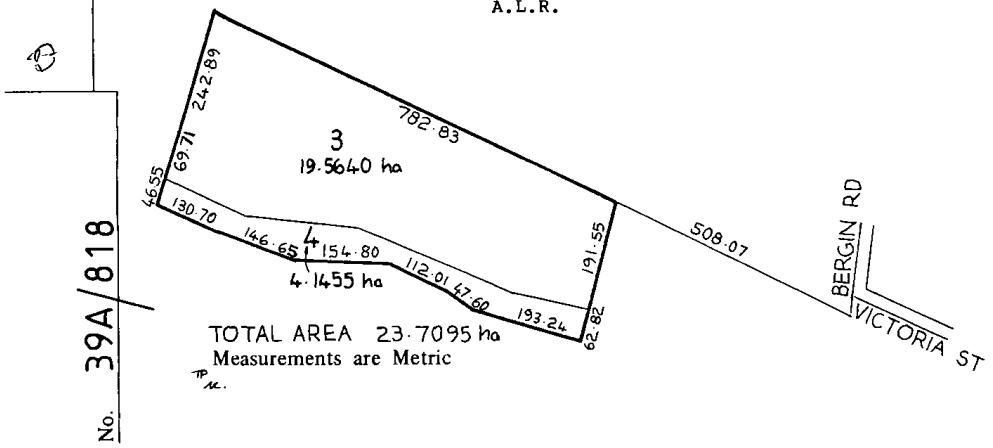
2. 929592.3 Mortgage to RGB Financial Services Limited - 2.10.1988 at 2.21 p.m.

3. 941248.1 Variation of Pipeline Easement Certificate 753554 - 17.8.1988 at 10.45 a.m.

A.L.R.

B.227593.3 Transfer to W. Crighton and Son Limited at Levin - 10.4.1992 at 9.05 a.m.

A.L.R.



CERTIFICATE OF TITLE No. 39A/818

93560H—50,000/2/89MK