4.2 Methodology

The Proponent committed to a transparent community and stakeholder engagement process. This included ensuring proactive and early engagement and seeking to create a positive long-term legacy in the region. Furthermore, the proponent pledged throughout the process to treat members of the local community and other stakeholders fairly, courteously and in a consistent and ethical manner.

The engagement approach for the Proposal was guided by the IAP2 Core Values and the *Public Participation Spectrum* (see Figure 2).

The spectrum is founded on the premise that different stakeholders will have varied levels of involvement in decision-making for different types of projects. For the purposes of this Proposal, **the relevant stakeholders were 'informed', 'consulted' and 'involved'** through an effective engagement process based on the objectives and promises outlined in the spectrum below.

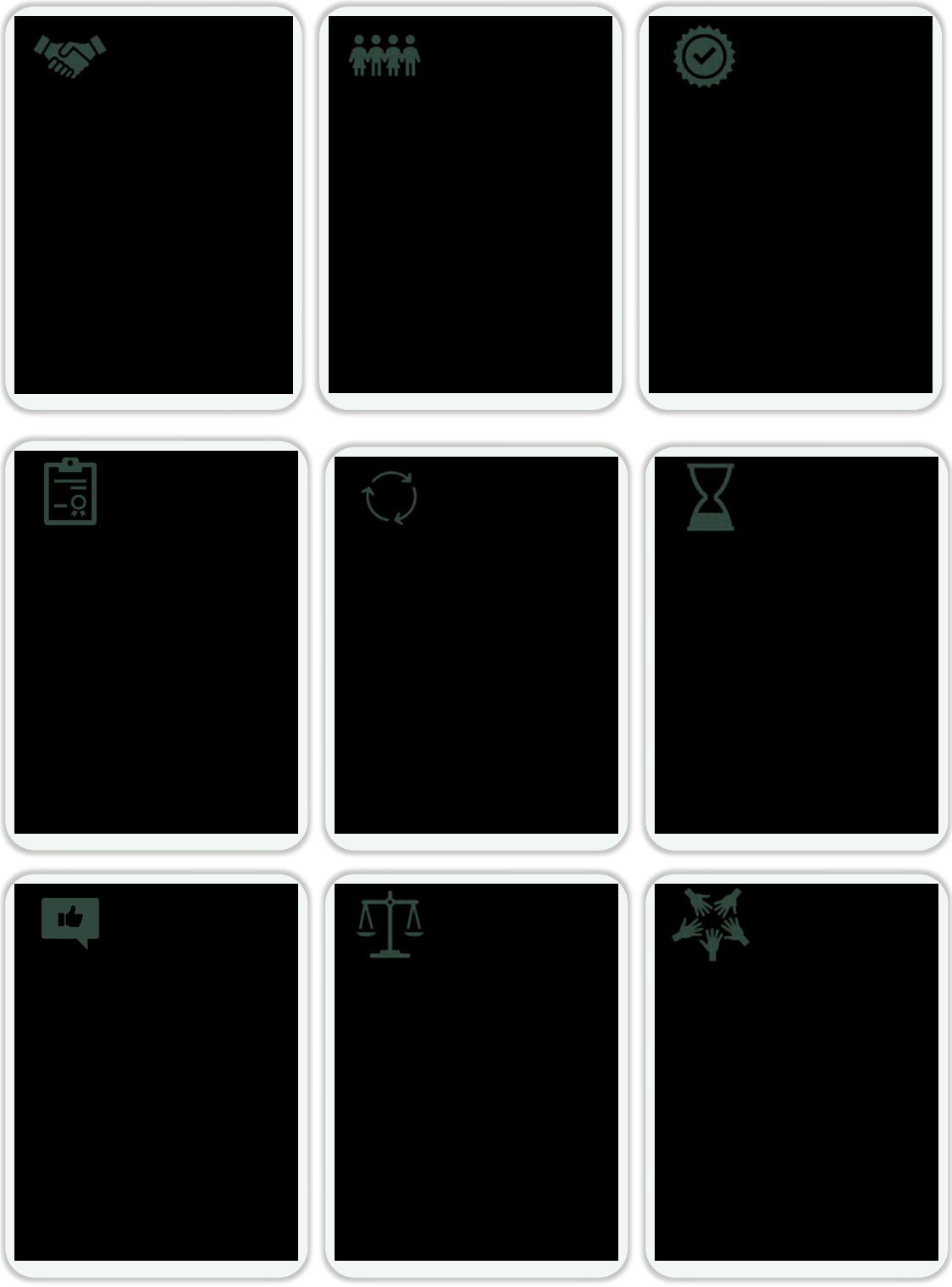
	Inform	Consult	Involve	Collaborate	Empower
Community engagement objective	Provide balanced and objective information. Assist the community in understanding all aspects of the project, including possible problems/issues.	Obtain feedback from the community on plans, options and/or decisions.	Work directly with the community throughout all stages of the project. Ensure community concerns and aspirations are consistently understood and considered.	Partner with the community in each aspect of planning, development and decision-making, including the development of alternatives and the identification of the preferred solution.	Place decision-making in the hands of the community, so the community leads the development of the renewable energy project.
Promise to community	Keep the community informed through all stages of development, including issues and delays.	Keep the community informed, listen and acknowledge suggestions and concerns. Provide feedback on how input influenced the decision.	Work with the community to ensure concerns and aspirations are directly reflected in the alternatives developed. Provide feedback on how input influenced the decision.	Look to the community for direct advice and innovation in formulating solutions. Incorporate advice and recommendations into decisions to the maximum extent possible.	Implement what the community decides.

Figure 2 Approaches to Community Engagement (IAP2, Public Participation Spectrum, 2014)

4.3 Principles

The following principles were adopted to guide the preparation of this strategy and the implementation of the community and stakeholder engagement process for the proposed Northern Midlands Solar Farm, based on the Clean Energy Council's *Best Practice Charter for Renewable Energy Projects* (2018), ReCFIT's *Draft Guideline for Community Engagement, Benefit Sharing and Local Procurement* and the IAP2 *Spectrum for Public Participation* (2018).

Principles of Engagement



4.4 Action Plan

An action plan was developed for the community and stakeholder engagement program, containing six phases throughout the lifecycle of the Proposal:

- Phase 1: Feasibility Stage (completed)
- Phase 2: Preliminary and Early engagement (completed)
- Phase 3; Pre-Application engagement (completed)
- Phase 4: Post-Lodgement engagement
- Phase 5: Construction
- Phase 6: Operation & decommissioning.

During all phases of the Proposal, the Proponent committed to inform, consult, and involve the appropriate stakeholders through an effective engagement process based on the objectives and principles of community engagement best practice and guidelines.

Examples of the tools and activities that were utilised to engage the community include:

- Presentations and briefings
- Direct landholder engagement
- Proposal website
- Newsletters, fact sheets, posters
- Letter drops to local community
- Door knocks / face to face meetings with residents within a 5km radius of the Proposal site
- Community Information Days (face to face drop-in sessions at the Cressy Hall)
- Complaints and handling process

These tools and activities were used to provide timely and informative progress updates on the Proposal and opportunities for the community and stakeholders to get involved in the planning and design process. In all stages, the Proponent and Proposal team ensured that clear information was made about the Proposal, the potential impacts and the mitigation measures proposed to manage them. By listening to stakeholders and acting to alleviate concerns, the Proponent sought to enhance the benefits and minimise the impacts that the Proposal may have on landowners, the community and local environment. This included design and siting changes to the various elements of the Proposal, and additional technical studies undertaken to identify and resolve any issues raised. The action plan was periodically updated to reflect the progress of Proposal and community input, as well as any emerging engagement needs and issues.

5. Stakeholder Identification

To engage appropriately and effectively with the local community and stakeholders, an important first step was to identify the full list of community and stakeholder groups who may be affected by and/or have interest in the Proposal. Table 1 below lists the stakeholders most relevant to this Proposal.

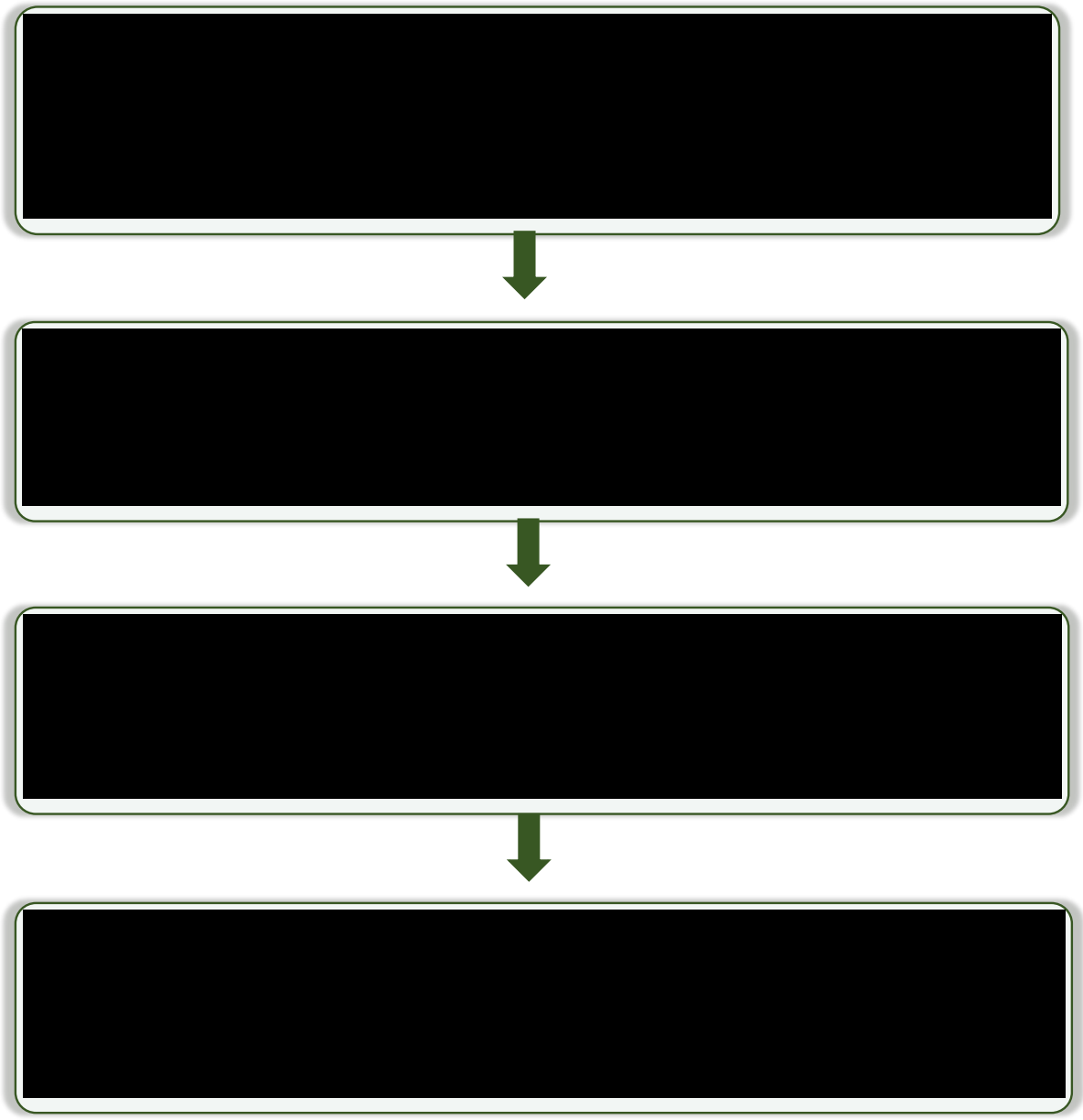
Table 1 Stakeholder identification for the Northern Midlands Solar Farm Proposal

Stakeholder Identification		
Group	**Sub-section**	**Description**
Neighbours	Near (<5km)	There are approximately 40 dwellings within 5km of the solar farm site boundary, none of which are located within 1km. Of the 40 Dwellings, 16 dwellings are transmission route landowners within 5km of the Proposal.
	Far (5-10km)	Residences greater than 5 kilometres from the site boundary, within the local area.
Local Businesses	Near (<5km)	Businesses up to 5 kilometres from the site boundary.
	Far (5-10km)	Businesses greater than 5 kilometres from the site boundary, within the local area.
Traditional Owners		The traditional owners of the Northern Midlands site are the Tyerrernotepanner people, represented by the Tasmanian Aboriginal Centre and the Aboriginal Land Council of Tasmania (ALCT).
Northern Midlands community		Community beyond the immediate area, within the Northern Midlands wider region.
Print Media	Local	Local publications and newsletters, including the Northern Midlands Courier.
	State	Tasmanian publications such as The Advocate, The Examiner, The Mercury, and Tasmanian Country.
Other Media	Local	Local Radio, including ABC Northern Tasmania.
	State	State Radio, including ABC Hobart, 7News Tasmania, 9News Tasmania, Triple M Hobart, Print Radio Tasmania.
Social Media		Local community Facebook groups, including the Northern Midlands Council Facebook page.
Federal government	Relevant Ministers	Minister for Climate Change and Energy, Hon Chris Bowen MP. Minster for Environment and Water, Hon Tanya Plibersek MP. Minister for Industry and Science, Mr. Ed Husic MP Minister for Agriculture, Fisheries and Forestry Senator the Hon. Murray Watt
	Local	Lower House, Member for Lyons – Mr Brian Mitchell MP (Labor) Upper House, Wendy Askew (Liberal), Catryna Bilyk (Labor), the Hon Carol Brown (Labor), Claire Chandler (Liberal), the Hon Richard Colbeck (Liberal), the Hon Jonathon Duniam (Liberal), Jacqui Lambie (Jacqui Lambie Network), Nick McKim (Greens), Helen Polley (Labor), Tammy Tyrrell (Jacqui Lambie Network), Anne Urquhart (Labor), Peter Whish-Wilson (Greens)
	Department Officers	Staff in government agencies such as DCCEEW
	Federal Agencies	Australian Renewable Energy Agency (ARENA)
State government	Relevant Ministers	Minister for Planning – Michael Ferguson Minister for Energy and Renewables – Guy Barnett Premier – Jeremy Rockliff Minister for Environment and Climate Change - Roger Jaensch

		Minister for Primary Industries and Water - Jo Palmer
	Local	House of Assembly (Lower House), Members for Lyons – Rebecca White (Labor), Guy Barnett (Liberal), Mark Shelton (Liberal), Jen Butler (Labor), John Tucker (Liberal) Legislative Council (Upper House) – Division of McIntyre, Hon Tania Rattray MLC (Independent)
	State Agencies	Department of State Growth - Renewables, Climate and Future Industries Tasmania (RECFIT), Skills Tasmania (Energising Tasmania), the Advisory Board on Skills.
Local government	Relevant Councillors	Mayor – Mary Knowles Deputy Mayor – Janet Lamber Councillors – Alison Andrews, Richard Archer, Dick Adams, Matthew Brooks, Richard Goss, Andrew McCullagh, and Paul Terrett,
Emergency Services		Tasmania Fire Service, Barton Brigade, Poatina Brigade, Cressy Brigade. State Emergency Services (SES) – Northern Midlands Unit, Campbell Town
Other Authorities		TasIrrigation
Community Groups		Tasmania Farmers and Graziers Association, Northern Midlands Business Association, and Cressy Local District Committee
Grid Operator		TasNetworks - Tasmania's main grid operator and transmission line developer

6. Overview of Engagement Stages

This section provides an overview of the community engagement activities conducted as part of this Proposal, in the lead up to the lodgement of the Development Application. The activities have been divided into four key stages and are summarised below:



Each stage has been designed to ensure the Proponent and the Proposal team deliver early, proactive, and meaningful engagement with the local community and stakeholders. The engagement program was scheduled to allow ample time for interested parties to be informed and involved, well in advance of the Development Application being lodged. The key engagement activities that were involved at each stage are summarised in the following chapters.

7. Feasibility Stage (March 2022 – June 2022)

The engagement stage with key process stakeholders took place from March to June 2022. The key objectives of this stage were to engage with local and State authorities to help garner support in the Proposal's early stages and to seek initial feedback. The meetings provided insights into the requirements and approvals process of an application for a large-scale solar farm. Part of the feasibility engagement stage involved the preparation of the Community & Stakeholder Engagement Strategy. This strategy was tailored to the Proposal's local and regional context, and local stakeholders and community groups were identified, along with the appropriate engagement activities that would be utilised in the engagement program.

The following stakeholders were engaged during the feasibility stage:

- Northern Midlands Council
- ReCFIT
- TasNetworks

The main engagement activities that occurred during this stage included:

- Face to Face meetings
- Briefings/presentations
- Phone Calls
- Preparing the Community & Stakeholder Engagement Strategy

The following table details the engagement activities conducted during the feasibility engagement stage:

Table 2 Summary of Feasibility Stage Engagement Activities

Date	Stakeholder	Details	Key Issues
Early 2022	Northern Midlands Council	Face to Face meeting	• Proposal benefits for the region • Identification of key issues to be explored • Relevant zones and codes • Potential referral authorities and relevant State agencies • Potential planning approvals pathways • Independent planner to be seconded to Council to assist in the assessment
Early 2022	ReCFIT	Face to Face Meeting	• Feasibility of existing infrastructure. 110kV does not have capacity for large-scale solar farm • Other relevant State government agencies • Tasmania's housing shortages, skill shortages and rental shortages • ReCFIT's coordination framework • ReCFIT's Renewable Energy Zones
Early 2022	TasNetworks & Watts Advisory	Face to face meeting	• Connection and potential route options explored • First phase for assessing impact, in the context of the Proposal viability assessment

7.1.1 Proposal Briefings

Preliminary discussions comprising of phone calls, meetings, briefings, and presentations were held with key process stakeholders including the Northern Midlands Council, ReCFIT, and TasNetworks. The first round of briefings included introducing the preliminary concept of the large-scale solar farm and providing opportunities for initial feedback.

The initial meetings and discussion with the Northern Midlands Council and ReCFIT, found the stakeholders to be supportive in principle of the Proposal and they provided insights into the potential planning and approvals pathway of solar farms. The insights gained from these initial meetings helped to understand the key opportunities and issues that would potentially occur for the Proposal. The Northern Midlands Council and ReCFIT provided key contacts to help the Proponent navigate these issues.

Watts Advisory were engaged to discuss grid connection and transmission line options for the Proposal with TasNetworks. This initial engagement set the parameters for the key technical aspects of transmission connection that would be required. These meetings provided important insights into what will be required at the initial phases of the Proposal, and to assess the impact of transmission connection in the context of an overall proposal viability assessment.

7.1.2 Summary

The feasibility engagement phase enabled the Proponent and Proposal team to gain initial feedback from key process stakeholders. Northern Midlands Council, ReCFIT and TasNetworks were supportive in-principle of the Proposal and provided valuable insights into the relevant policy setting and approvals pathway process and the key technical assessments required for Development Application.

The key issues raised during this period of engagement were mainly concerned with the stakeholder identification and understanding which government agencies would play a role in the approvals process for Tasmania's first large-scale solar farm. Gaining this knowledge at a stage of the Proposal allowed the Proponent to adjust the engagement strategy and commence the engagement program accordingly. The outcomes of the engagement activities undertaken during the feasibility engagement stage showcased that the key process stakeholders were generally supportive of the Proposal and helped to formulate the engagement program for the next period of preliminary and early engagement.

8. Preliminary & Early Engagement (July 2022 – Nov 2022)

The early engagement phase commenced in July 2022 and was completed in November 2022. During this stage, the specialist consultants began drafting their preliminary technical assessments, and the preliminary concept design of the Proposal was established. They key objectives were to update and inform previously engaged stakeholders, as well as to introduce the Proposal to neighbouring residents and potential transmission landowners. This stage of engagement was critical in garnering support for the Proposal and to continue to involve the key stakeholders in the design and planning process.

- The key stakeholders in the early engagement phase included: Neighbouring Property Owners
- Potential Transmission Landowners
- Northern Midlands Council
- ReCFIT
- TasNetworks
- EPA
- Aboriginal community groups

The main engagement activities that occurred during this phase included:

- Face to Face meetings
- Online Meetings
- Briefings/presentations
- Phone Calls
- Communication Materials

The following table outlines the key engagement activities that occurred during the early engagement phase:

Table 3 Summary of Early Engagement Stage Activities

Date	Stakeholder	Details	Key Issues
Sept 2022	EPA	Online Meeting	• The potential approval pathways for Tasmania's first large-scale solar farm and the anticipated level of involvement of the EPA • The potential environmental constraints and mitigation measures • The requirement for a Project Proposal to be prepared and submitted to the EPA, providing further details of the Proposal
Oct 2022	Neighbouring Property Owners	Meetings about Access Tracks and Infrastructure	• Further investigation requiring sub consultants entering neighbouring properties. • Construction impacts for neighbouring properties • Noise mitigation measures from associated infrastructure such as the battery or switchyard. • Pivot irrigators and potential impacts
Oct 2022	Potential Transmission Landowners	Meetings about Transmission Line	• Three transmission route options being explored • Potential impacts on landowners properties

			• Further investigation requiring sub consultants entering their properties
Nov 2022	Northern Midlands Council	Proposal Briefing (in person)	• Proposal progress update to Council • Planning approval pathways discussed • Proposal to second an independent planner to Council • Community and stakeholder engagement strategy and action plan
Nov 2022	ReCFIT	Proposal Briefing (in person)	• Proposal progress update to ReCFIT • Planning approvals pathway • Draft ReCFIT community engagement guidelines • ReCFIT coordination framework • Progress update on Renewable Energy Zones in Tasmania
Nov 2022	TasNetworks	Meetings	• Grid connection and transmission line options for the Proposal.
Nov 2022	Aboriginal community groups	Meetings	• Initial discussions and introduction to the Proposal

8.1.1 Discussions with EPA

A meeting was held with the EPA to discuss the potential planning approval pathways for the Proposal, being Tasmania's first large-scale solar farm. The Proposal's classification would determine the level of involvement by the EPA. Previous cases of large-scale (renewable and non-renewable) projects in Tasmania were discussed outlining some of the key decisions that were made based on their environmental impacts. It was discussed that a Project Proposal (containing further details about the Proposal) should be prepared by the Proponent and submitted to the EPA for review.

It was later acknowledged via a letter from the EPA that the Proposal is unlikely to cause significant environmental or health impacts (see Chapter 9 for further details).

8.1.2 Proposal Update Briefings

Presentation briefings were held with the with Northern Midlands Council and ReCFIT to provide an update on the progress of the Proposal since the feasibility stage and the initial engagement back in June 2022. This included updates regarding:

- The Proposal details, including draft maps, masterplans, and proposal timelines.
- The development process and timeline.
- The potential benefits of the Proposal, including its efficiency, effects on the price of electricity, jobs creation, community development funding, and its contribution to combatting climate change.
- The benefits of solar generation and the potential mitigation measures proposed to manage any issues.

8.1.3 Discussions with Neighbours

Initial discussions were held with neighbouring landowners about the preliminary concept and design of the Proposal. These discussions took the form of informal discussions between the Proponent and the neighbouring property owners at their properties. This provided an opportunity for the Proponent to introduce the Proposal and gauge the key concerns at the initial design stage. The Proponent also advised the neighbouring properties of the potential of new access tracks and infrastructure in the

area. These discussions with neighbouring property owners will continue to be pivotal as the Proposal progresses.

8.1.4 Discussions with Potential Transmission Landowners

Initial discussions were held with potential transmission landowners about the preliminary concept and design of the proposed 220kv transmission line that is proposed for the Proposal. These discussions took the form of informal discussions between the Proponent and the potential transmission landowners at their properties. The Proponent provided a high-level overview of the Proposal and discussed the three transmission route options being explored. This was used as an opportunity to introduce the Proposal to the landowners and gauge their interest and concerns with the Proposal moving forward. The Proponent outlined the areas that would be surveyed, as well as the need for further investigations of the landowner's properties (subject to their consent). Discussions between the Proponent and landowners of the proposed transmission route will continue throughout the detailed design stage of the proposal.

8.1.5 Engagement with Registered Indigenous Parties

This stage also involved initial engagement with the Registered Indigenous Parties, with the assistance of a Cultural Heritage consultant.

8.1.6 Summary

The preliminary and early engagement activities were important in maintaining the relationships built with key process stakeholders, as well as establishing initial contact with the EPA. An important part of this stage was also informing neighbouring property owners and potential transmission route landowners about the Proposal. At this stage a preliminary concept design and technical assessments were drafted, meaning information about the Proposal could be more readily shared and any concerns more meaningfully expressed.

Another key stakeholder engaged during this stage was the EPA, and the Proponent agreed to provide further details on the Proposal to the EPA once the technical assessments were further advanced. The initial discussions with neighbouring property owners and transmission landowners were centred around irrigation and potential impacts to agricultural productivity in the area. However, the feedback was largely positive. The key process stakeholders remained generally supportive after the provision of more information. Ongoing discussions with neighbouring property owners and transmission landowners will continue to be pivotal as the Proposal progresses.

The feedback received during the preliminary and early engagement activities were helpful in establishing the next steps in the engagement program.

9. Pre-Application Engagement (Dec 2022 – April 2023)

The pre-application engagement commenced in December 2022 and was completed in April 2023. The pre-application engagement phase aimed at introducing the Proposal to the broader local community, provide periodic Proposal updates to the key process stakeholders and continue discussions with neighbouring properties and the identified transmission line landowners. This stage was also designed to provide the wider Northern Midlands community with opportunities to have their say on the Proposal, and to listen to their concerns. This stage was designed to ensure that these concerns could be considered in ample time before the lodgement of the development application.

The key stakeholders in the pre-application engagement stage included:

- Northern Midlands Council
- Northern Midlands Councillors
- Northern Midlands Mayor
- Premier of Tasmania
- TasNetworks
- Local Community of Northern Midlands
- Tasmanian Farmers and Graziers Association
- Transmission Landowners
- ReCFIT
- Skills Tasmania
- EPA
- Tas Irrigation

The main engagement activities that occurred during this phase included:

- Project Proposal
- Door Knocks
- Face to face meetings
- Online meetings
- Phone calls
- Briefings/presentations
- Community info day
- Letters
- Newspaper adverts
- Facts sheets
- Proposal Website
- Making technical consultant reports publicly available on web
- Draft Option Agreements with Transmission landowners

The following section outlines some of the key engagement activities which occurred during the pre-application stage:

Table 4 Summary of Pre-Application Engagement Activities

Date	Stakeholder	Details	Key Issues
Jan 2023	Premier of Tasmania	Proposal Briefing (In-person meeting)	• Site suitability and proposal justification • Community engagement program •

Mar 2023	Councillors of Northern Midlands Council	Proposal Briefing (Online Zoom presentation)	• Agrisolar and agricultural productivity • Transmission connection into Palmerston Substation • Details on the Battery Energy Storage System • Noise and what is expected of a solar farm • Development cost and investment • Height of transmission towers
Mar 2023	Tasmanian Farmers and Grazier Association	Online meeting	• Discussed key issues related to irrigation in the area. • Agricultural developments occurring in area.
Mar 2023	Transmission Landowners	In Person Meetings	• Discussions with landowners along the selected route continued, and the Proponent commenced the drafting of option agreements
Mar 2023	Community, Project Neighbours	Door Knocking	• Proposal Fact sheets left with community members. • Information about the Community Day was shared
Mar 2023	Local Community and Interested Parties	Community Information Day	• Potential amenity, noise, and environmental impacts of the Proposal • Opportunities and benefits of the Proposal • Concerns about irrigation in the area • Transmission route and height of towers
Apr 2023	Northern Midlands Council	Pre-Application Meeting	• Process to engage an independent planner to be seconded to assist the Northern Midlands Council • Plans to be submitted with the Development Application.
May 2023	Skills Tasmania	Online meeting	• Briefing to Skills Tasmania representative about the proposal and expected job creation. Skills Tasmania to review and comment on the Socio-Economic Impact Assessment report.

9.1.1 Discussions with Neighbours

Ongoing discussions were held with neighbouring property owners to provide timely updates of the Proposal. As the technical assessments progressed, more information about what the Proposal would entail and what it would mean for the neighbouring property owners was able to be delivered. This once again took the form of informal meetings between the Proponent and the neighbours and with the provision of technical assessments what the Proposal will mean for their property.

9.1.2 Discussions with Potential Transmission Landowners

Discussions with landowners along the selected route continued, and the Proponent commenced the drafting of option agreements. Engagement with these landowners will continue through the detailed design phase.

9.1.3 Engagement with Registered Indigenous Parties

This stage also included engagement with the Registered Indigenous Parties by the Proposal team's Cultural Heritage consultant. Please refer to the Aboriginal Cultural Heritage Assessment report submitted as part of the Development Application for this proposal, for further information.

9.1.4 Communication Materials

Communication materials were prepared to provide information and raise awareness about the Proposal. A website was established containing information about the Proponent, Proposal team, and the Proposal. As progress was made, technical information was added, along with key information regarding the process, the design and development and announcements about Proposal milestones. Factsheets were created based on relevant themes and concerns that had been raised during briefings and meetings in earlier stages of engagement. This included fact sheets outlining technical aspects of the transmission lines and towers, planning approvals pathway and general proposal information. These were distributed during the doorknocks and at the community information day. Letters in advance were distributed prior to the doorknock, as well as thank you letters after the engagement activity took place.

The following table outlines the key communication materials developed during the early engagement phase:

Table 5 Summary of Communication Materials

Activity	Engagement Objective	Engagement Method
Website	To provide up-to-date information about the proposal	• Update website • Upload technical information and facts sheets to make publicly available
Letter in advance	To inform the community of the Proposal team's presence in the community.	• Residents within 5km of the site boundary were sent this letter via post
Transmission landowner Information Packs	To provide detailed and meaningful information for landowners of the Proposal and what it means for their property	• Distributed by Proponent during face-to-face meetings with landowners.
Factsheets	To provide Proposal information and encourage community input and engagement	• Included in landowner information packs. • Distributed to residents during door knocks. • Provided to attendees of NMSF Community Information Day. • Posted on Northern Midlands Council social media page.
Ads and Posters	To raise awareness, promote the Proposal and encourage community information day attendance	• Distributed to local newspaper and Council. • Council posted via social media and up at Council offices.
Newspaper articles	To raise awareness, promote the Proposal and encourage community information day attendance	• Distributed to State/regional newspapers.
Thank You Letter	To show appreciation of the community and thank them for their engagement to date	• Letters were sent out to the residents who were door knocked via post.
Website, media, and email monitoring	To listen to the community and key stakeholders	• Daily monitoring of website media and emails.

9.1.5 Door Knocks

Properties within 5km of the Proposal were door knocked on March 20th, 2023. Prior to the doorknocking, a letter in advance was posted to residents to inform them of the visit. The purpose of the door knock was to provide a direct point of contact to the community, to hear the community's concern, provide Proposal information and encourage engagement and attendance at the community information day. In total, there were approximately 30 houses door knocked and of this cohort, 11 residents were home. Transmission line landowners, houses with locked gates, houses with guard dogs or farms with biosecurity signs out the front were not door knocked. For residents that weren't home, a proposal fact sheet was left with a note with details of the community information session on Tuesday 28th March. The community information day was also mentioned to the residents that were home, and written details were left as well with the specific details.

9.1.6 Community Information Day

The community information day was held at the Cressy Community Centre Hall, 67 Main Street Cressy from 3pm to 7.30pm. In total, 33 people attended. In addition, seven members of the Proposal team were present to greet people and provide technical information. The purposed of the community information day was to provide Proposal information, an opportunity for community members to ask questions and have their say, encourage engagement in the planning process, as well as to establish a point of contact.

Generally, the attendees of the Northern Midlands Solar Farm community information day were positive about the Proposal. Many attendees were interested to learn more about large scale solar project technology. There was also a small group of farmers from neighbouring properties that had questions specifically related to potential impacts on their farming activities.

Contact details of the attendees were recorded and will be used to provide further information about the Proposal as it continues to progress. All community feedback was recorded, with topical issues addressed and communicated by the Proposal team. Feedback was generally positive and apart from a few concerns raised, the information day revealed widespread support for the Proposal.

The following table outlines some of the topics and concerns that were brought to the Proposal team's attention:

Table 6 Summary of Issues raised at the NMSF Community Information Day

Topic	Details
Tas Irrigation	Concerns about compulsory acquisition
Marinus Link	Comment: 'Good for Australia but not good for Tasmania' (regarding Marinus)
Recycling solar panels	Interested in the lifecycle of solar panels and how these will be recycled.
Proposal Size	Some people commented that they have heard of renewable projects being expanded once planning approval has been granted
Solar panel reflections	Comments were made about large solar projects on the mainland and their potential for glint and glare

'Consultation fatigue'	There are number of major projects in the area and local community members are experiencing consultation fatigue
Environment, raptors	Concerns about raptors getting caught in transmission lines
Agricultural, farming	Grazing of sheep and cows in the area of solar panels
Sand run off	Comment about potential sand running off into adjacent damns and erosion, especially from the sandpit paddock
Deer/pest management	People were interested about how this factor would be managed as to not impact neighbouring properties
Transmission lines	The size of the new towers and the new transmission line was noted by some attendees

9.1.7 Summary

The pre-application engagement phase aimed at introducing the Proposal to the wider local community, providing timely updates of the Proposal and continuing discussions with neighbouring properties and the identified transmission line landowners. The engagement activities employed during this period were deemed successful in implementing the key objectives of this engagement period. This has been largely indicated by the positive feedback received from both key stakeholder and the local community.

Through discussions with the Northern Midlands Council and the EPA, the most appropriate planning approval pathway was determined. At this stage, based on the technical assessments conducted to date, it was considered that the Proposal is unlikely to have a significant environmental or health impact.

As the Proposal is the first of its kind in Tasmania, local community members showed a keen interest in the Proposal and understanding its key technical aspects. A small number of community members were concerned with amenity and environmental impacts of the Proposal. The provision of environmental and technical assessments aimed to alleviate these concerns. The concerns raised at the community information day, along with briefings and presentations were taken into consideration in the final design and layout of the Proposal. Aside from some queries raised about potential amenity impacts, the responses received during this stage were largely positive.

10. Post-Lodgement Engagement (May 2023 onwards)

This phase of engagement will commence in May 2023, following the lodgement of the Development Application. While the Proposal is undergoing assessment for statutory approval, the Proponent and the Proposal team will continue to engage the local community, transmission landowners and other key stakeholders. This is to ensure the community understands the opportunities for formal public input on the Proposal as it is assessed, as well as to provide key updates related to the Proposal.

The key stakeholders to be engaged during the post-lodgement period include the following:

- Northern Midlands Council
- Premier of Tasmania
- TasNetworks
- Local community of the Northern Midlands
- Transmission landowners and neighbouring property owners
- Tas Irrigation
- ReCFIT
- Skills Tasmania
- EPA
- Aboriginal community groups

The Post-lodgement engagement stage will likely include the following activities:

- A second Community Information Day
- Provision of updated fact sheets
- Website responses and updates
- Newspaper advertisements and articles
- Option agreements with relevant transmission landowners
- Meetings as requested to inform, consult, or involve the interested or concerned local community and stakeholder groups

As a key member of the community, the Proponent, with the support of Cogency, remains committed to proactive, and meaningful engagement with the local community and stakeholders, which has started from the preliminary concept design phase.

11. Conclusion

The Northern Midlands Solar Farm represents the next generation of renewable energy development in Tasmania. The Proponent, Connorville Estates, has committed to the development of this long-term solar energy asset that would bring about positive impacts for the local community, generate more affordable and secure electricity and stimulate the local economy.

In the planning and development process for the Proposal, the Proponent has sought to develop and maintain respectful and meaningful relationships with key process stakeholders, neighbouring residents, and transmission line landowners, as well as the wider local community. The development of the Proposal has been defined by two-way communication that has been free-flowing, with issues raised by stakeholders and community members addressed in a timely manner by the Proposal team. The community information day and responses received from key the key stakeholders have received widespread support for the Proposal.

The four stages of community and stakeholder engagement, based on a robust Community & Stakeholder Engagement Strategy has enabled early, proactive, and meaningful engagement at each pivotal stage of development of the Proposal to occur. Supported by the findings of community engagement activities undertaken to date, interaction between the Proposal team and the community has resulted in open and honest feedback. By listening to stakeholder's voices and being pro-active in alleviating concerns, the potential impacts the Proposal may have on landowners, the community and local environment are able to be minimised and mitigated.

Moving forward, The Proponent, with the support of Cogency, remains committed to proactive, and meaningful engagement with the local community and stakeholders, which has started from the preliminary concept design phase. This has been made evident through the Proponent's commitment to preliminary and ongoing engagement with key stakeholders (such as the EPA, ReCFIT, Council, Aboriginal community groups, and neighbouring properties) to garner support, gain initial feedback to understand their views on the Proposal and to update the design and planning accordingly.

12. Appendix – Communication Materials

Northern Midlands Solar Farm

The Project

What is it?

The Northern Midlands Solar Farm is a 288 MW solar and battery energy facility, proposed to be built on two sections of farmland on the Connorville Station Cressy property, off Macquarie Road.

The site is currently used for agricultural activities (mostly grazing) which are proposed to continue once the solar farm is operational. The proposal includes photo-voltaic panels, substations and battery storage.

In addition, a new 220kV transmission line is proposed to connect the project to the energy grid via Palmerston Substation near Poatina. The new line follows the existing 1001kV transmission line from the site to the substation options for grid connection for the project are being explored.

Benefits

Job creation in the Northern Midlands/central Tasmania region.

Renewable energy development contributes to the downward pressure on power prices

Assists with the renewable energy transition.

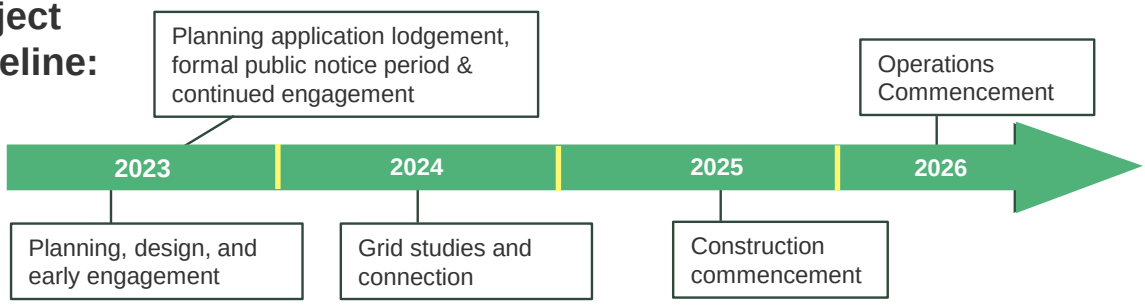
Why build here and why build now?

Connorville Station can support a large-scale energy project as well as continue agricultural grazing and farming. The size, location and topographical conditions of the property make it ideal for a solar farm and associated infrastructure.

The Northern Midlands Solar Farm will contribute to securing Tasmania's economic prosperity through the transition to renewable energy. Battery storage will allow for energy to be released into the grid during periods of peak demand.

Developing solar power generation in the Northern Midlands region is an important step to increasing the supply of reliable and affordable power, and to ensuring growth in Tasmania's economy through investment and job creation.

Project Timeline:



March 2023

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Northern Midlands Solar Farm

The Project

Site Suitability

- ✓ Large landholding within single ownership
- ✓ Relatively flat topographical conditions
- ✓ Located outside the urban settlement areas of Cressy and Poatina.
- ✓ Close to the electricity grid and Palmerston transmission station
- ✓ Access to main roads and transport
- ✓ Existing grazing activities can continue and coexist with the operation of the solar farm
- ✓ Significant land disturbance due to long standing agricultural practices. Minimal flora and fauna habitat value.
- ✓ Continue use of the land for agricultural and solar energy generation through 'agrisolar'. Solar energy and agriculture can both operate and continue of the same land.

An indicative example of the type of solar panels proposed to be installed. The panels will utilise active tracking technology that will follow the path of the sun.

Design Considerations

The proposed solar farm has been designed and planned to mitigate, minimise and offset any negative impacts. The solar farm will implement the following strategies to mitigate potential impacts;

The Development Application will be accompanied by technical impact assessments for a range of issues such as biodiversity, noise, visual, traffic and fire.

Working with landowners and TasNetworks to minimise the visual impact of the proposed transmission line route, including sharing the existing 110kV easement as much as possible.

The solar farm is proposed be built to allow for the continued use of the land for grazing sheep, preserving the value of the farmland.

Protective screening vegetation is proposed on some boundaries of the site.

For more information, please visit our website or contact Cogency:

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Northern Midlands Solar Farm

Transmission Line

Northern Midlands Solar Farm

The Northern Midlands Solar Farm is the proposed home of a new solar and battery storage facility capable of producing approximately 288 MW of clean energy.

As part of the proposal, a 15km long, 220 kV transmission line is proposed to connect the solar farm to the Palmerston Substation, near Poatina. This is a crucial part of the project as it will connect the solar farm to the National Energy Market.

Why is a new transmission line needed?

A new transmission line is needed to deliver the power generated by the solar farm to the grid. The existing 110 kV overhead transmission line, which runs adjacent to the project site, does not have the capacity to support grid connection. Therefore, a new 220 kV line is proposed to connect to the Palmerston Substation at Poatina.

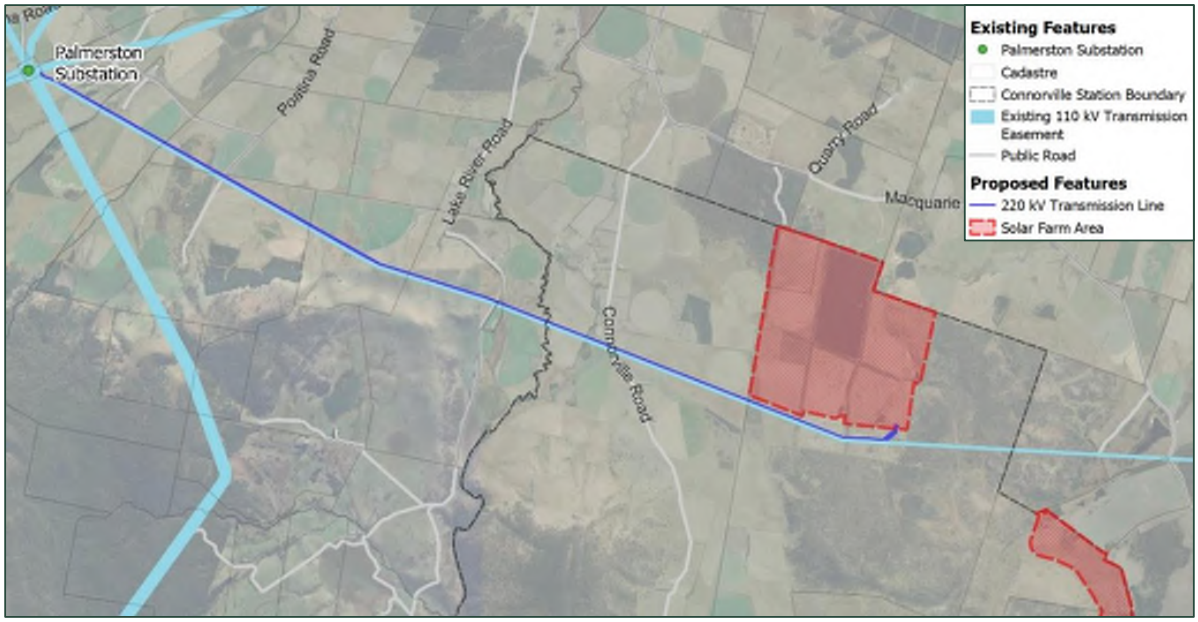
How was the line route selected?

To identify the route, a consortium of qualified subconsultants, including Watts Advisory, rigorously assessed and explored route options to connect to the solar farm to the Palmerston Substation. A wide range of technical, safety, social, environmental and other factors were considered which focused on determining key ecological and logistical limitations.

This route was chosen as it:
- Meets technical and construction requirements
- Avoids protected vegetation and areas of significant cultural heritage value
- Minimises new transmission line easements by sharing existing easements

The proposed route runs adjacent to the existing 110 KV line. The project will benefit from sharing some of the existing transmission easement, as it will reduce the amount of clearing required.

Please refer to the below map for the location of the existing transmission lines and the proposed new 220 kV route.



Proposed Solar Farm and Transmission Map

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Northern Midlands Solar Farm

Transmission Line

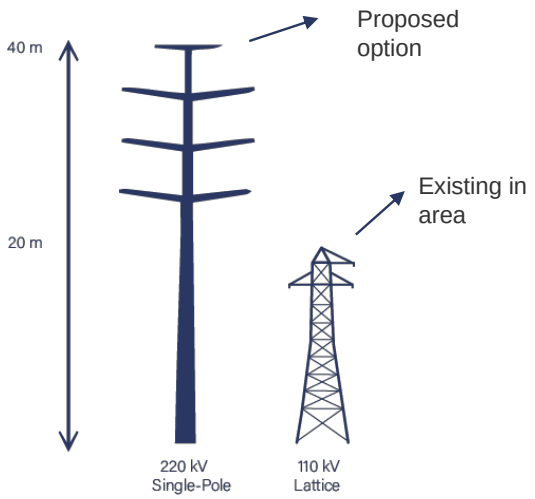
Community Input

Initial discussions between the project team and affected landowners of the proposed route have already taken place and will continue throughout the detailed design stage of the proposal. Community and stakeholder engagement related to the proposed transmission line commenced in early 2023, well in advance of the Development Application being lodged. The objective is to provide the community ample time to get involved, and their input is strongly encouraged.

What will the transmission line look like?

The new line is proposed to be located around 25-30 metres from the existing transmission line to meet minimum clearance distances and ensure both lines can operate safely. It is expected to involve steel poles approximately 35-45m in height. The below image shows an indicative design of the new transmission line next to the existing transmission line.

Pole Comparison



Single-Pole vs Lattice

Transmission Line Comparison

The proposed transmission line utilises a distinct design when compared to the existing transmission towers found in the Northern Midlands Area.

The images above shows an example of a 220 kV single-pole transmission and the existing 110 kV lattice tower in the Northern Midlands. The indicative shape of the powerline can be seen in the comparative diagram to the left.

The size of the pole structures used for the transmission line will depend on various factors, including technical requirements of the electricity network. There may also be variations in the height of individual poles based on the requirements of each location. The exact height, spacing and location of towers will be worked out at the detailed design stage.

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Northern Midlands Solar Farm

Planning Approval Pathway

Permit approval will come from the Northern Midlands Council

The Proposal will be assessed against a number of criteria before a permit is granted.

Cogency welcomes community input. See the end of the document for our contact details.

The following outlines the key aspects of the planning approvals process for the development of a solar farm in the Northern Midlands region.

The Planning Policy

The Northern Midlands Council reformed its planning system in 2022. This change was made to harmonise it with the new, State-wide Tasmanian Planning Scheme (TPS). It sets out the requirements for use or development of land in accordance with the *Land Use Planning and Approvals Act 1993* (the Act).

The new 2022 Northern Midlands Planning Scheme under the TPS has two parts: (a) a set of consistent, State-wide planning rules called the State Planning Provisions (SPPs); and (b) Local Provisions Schedules (LPSs), which is administered by Council and determines the locations of zones and overlays implemented from the SPPs, and identifies special areas to be subject to additional, unique controls.

'Utilities' is the most appropriate definition in the planning scheme for a solar farm. The Proposal is located within an Agricultural Zone under Clause 21.0 to the 2022 Northern Midlands Planning Scheme. As per the Agriculture Zone, the proposal requires a planning permit from the planning authority.

The Proposal is also affected by a number of Codes under the Planning Scheme, which set out mandatory and discretionary use and development controls. The following Codes affect the proposal:

- Electricity Transmission Infrastructure Code (C4.0),
- Natural Assets Code (C7.0)
- Attenuation Code (C9.0)
- Bushfire-Prone Areas Code (C13.0)
- Landslip Hazard Code (C15.0).

Who Approves It?

Under current legislation, a large-scale solar farm in Tasmania is considered a "Level 1 Activity", meaning planning approval would come from the Northern Midlands Council.

How is it Approved?

Under the 2022 Northern Midlands Planning Scheme the proposal is considered a discretionary use, meaning a planning permit is required before development can occur.

The Northern Midlands Council will evaluate the Development Application using a set of existing decision guidelines. Council will consider the following before project approval is granted:

- The requirements of the the *Land Use Planning and Approvals Act 1993* (the Act).
- The State Planning Provisions.
- The controls set out in the Zone and Codes under the Northern Midlands Council Planning Scheme.
- The impact of the development on the agricultural productivity of the land.
- The potential effects on the amenity of the surrounding area.
- The presence of cultural heritage, flora and fauna (including native vegetation) and the likely impacts.
- The degree of potential flood, erosion or fire hazard.
- The potential impact on noise and traffic in the area.
- The socio-economic benefits and impacts to the region, such as local job creation.

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Northern Midlands Solar Farm

Planning Approval Pathway

State Legislation & Strategies

At the State level, there is ample legislation and strategies that help guide the use and development of land for renewable energy facilities, as well as protecting the natural environment. The following state legislation and strategies are applicable:

- *Land Use Planning and Approvals Act 1993*
  Environmental Management and Pollution Control Act 1994
- *Tasmanian Conservation Act 2022*
- Tasmanian Renewable Energy Action Plan 2020 (ReCFIT)
- Tasmanian Renewable Energy Coordination Framework 2022 (ReCFIT)
- Guideline for Community Engagement, Benefit Sharing and Local Procurement (ReCFIT).
- Northern Tasmania Regional Land Use Strategy

Federal Requirements

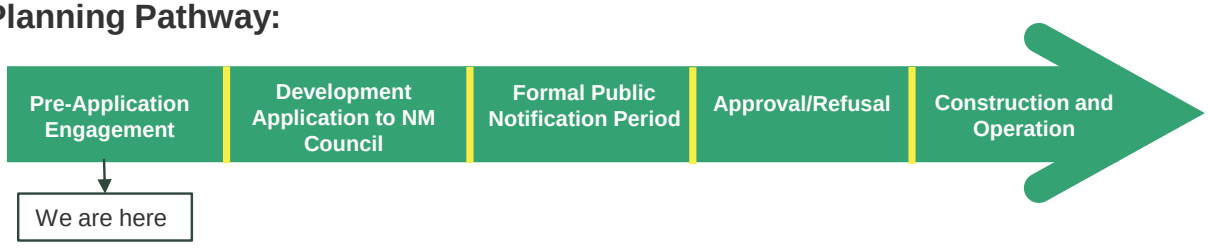
At the Federal level, the Department of Climate Change, Energy, the Environment and Water (DCCEEW), in accordance with the *Environment Protection and Biodiversity Conservation Act 1999* (Cth.), require additional information, where it is determined that a proposal may impact Matters of National Environmental Significance (MNES).

Based on the technical assessments to date, it has been determined that a referral under the EPBC Act to DCCEEW is unlikely to be required.

Before the Proposal is Approved, Authorities Check to Make Sure It…

- Complies with all State laws
- Aligns with State and local policies
- Meets zone and codes provisions
- Will not affect water quality
- Protects native vegetation
- Minimises bushfire hazard
- Does not impact traffic levels
- Does not limit agriculture
- Considers feedback from the community and other stakeholders

Planning Pathway:



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Letter in Advance

March 2023

Dear resident,

We are writing to advise you that we will be undertaking a community engagement programme for the proposed Northern Midlands Solar Farm, situated on two sections of land owned at Connorville Station off Macquarie Road, Cressy.

The proposal is currently at the early planning and design stages, and our goal is to provide the local community with sufficient time to be informed and involved, well in advance of lodging a planning application with the responsible authority later in 2023.

About the Project

The Northern Midland Solar Farm is a 300MW solar project proposed to be developed on multiple parcels of land totalling approximately 494 hectares within the Connorville Station property. It also includes the development of a battery energy storage system and a new 220kV transmission line that connects the project to the Palmerston substation.

The site is approximately 35km south of outer Launceston and will be accessed via Connorville Road and Macquarie Road.

Connorville Station is currently used for agricultural activities (mostly grazing), which is proposed to continue on the site once the solar farm is operational.

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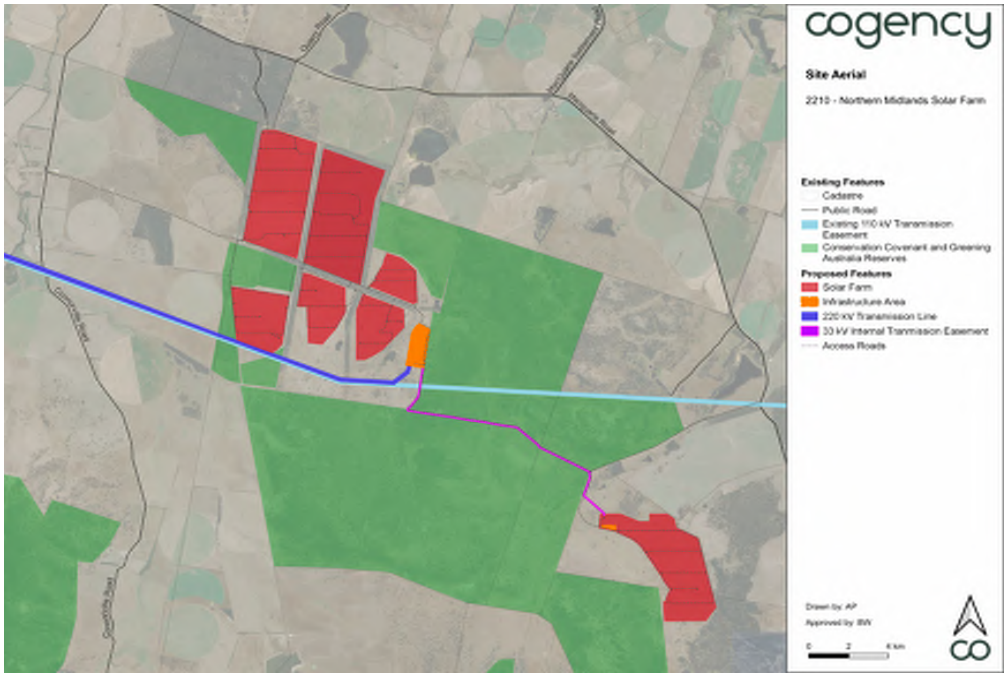
Letter in Advance

Project Map



Community Engagement

Door knocks - Neighbouring properties

The first round of door knocks will begin on 20 March 2023, weather permitting. Our community engagement specialists will be doorknocking all neighbouring properties, to inform residents of the proposal, provide some information materials, and to answer any initial questions.

Community information day – Open to the public

Cogency Australia will also be hosting a community information day on Tuesday 28 March 2023, from 3pm to 7.30pm at the Cressy Community Centre, 67 Main Street, Cressy. This will provide an opportunity for the wider community to learn more, and to provide early feedback and input to the proposal. Further opportunities to find out more about the project, including making a submission, once the application is lodged with the responsible authority later in 2023.

How to get in contact

Project information is available via our email address, website or phone if you are not home at the time of the doorknock (listed below).

Should you have any questions about the proposed Northern Midlands Solar Farm, please do not hesitate to call or email us. Contact details are listed below.

Yours Sincerely,

Tracey Ward

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www.cogencyaustralia.com.au

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P: 0452 593 428
E: consultation@cogencyaustralia.com.au

Northern Midlands Solar Farm

Thank You Letter

March 2023

Dear Resident,

Northern Midlands Solar Farm

We conducted a door knock in the area on Monday 20 March to speak with the project neighbours within 5km of the proposed Northern Midlands Solar Farm site. The purpose of the door knock was to let people know about the project, provide information, and seek feedback on the proposal before lodging a Development Application.

Thank you to neighbours who were home, for taking the time to speak with us. For those who weren't home, or the gate was locked, we left information about the project in your letterbox.

Information was also left regarding the community information day hosted on Tuesday 28 March at the Cressy Community Centre Hall, by Robert Luxmoore and Cogency Australia.

We hope you were able to attend the community information day and had an opportunity to meet with members of the project team to discuss the project, as well as enjoy the light refreshments made available. We hope our team was able to answer any questions you may have regarding the project.

If you were unable to attend, the project information can be accessed through the website: www.northernmidlandssolarfarm.mysocialpinpoint.com.au

There will be another community information day held once the Development Application has been submitted. Details of this information day will be advertised in local newspapers and on the website.

We will continue to provide updates on the project, on the website. If you would like information sent to you directly by email, please send your name and email address to consultation@cogencyaustralia.com.au, requesting to be placed on the Northern Midlands Solar Farm email list.

Looking forward to continued engagement on this project!

Cheers,

Tracey Ward

Community Engagement Manager

Cogency Australia

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Robert Luxmoore Project Management


Community
INFORMATION DAY
Northern Midlands
Solar Farm
Cogency Australia and Robert Luxmoore would like to invite you to a community information day for the proposed Northern Midlands Solar Farm.
This information day will be a forum for community members to meet with the project team, learn more about the project and provide feedback on the proposal.
Tuesday
28th March
3pm to 7.30pm
Cressy Community Centre Hall
67 Main Street, Cressy
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ROBERT LUXMOORE
consultation@cogencyaustralia.com.au
northernmidlandssolarfarm@mysocialpinpoint.com.au
0452 593 428

Tuesday
28th March
3pm to 7.30pm

Northern Midlands Solar Farm

Community INFORMATION DAY

Cogency Australia and Robert Luxmoore would like to invite you to a community information day for the proposed Northern Midlands Solar Farm.

This information day will be a forum for community members to meet with the project team, learn more about the project and provide feedback on the proposal.

Cressy Community Centre Hall
67 Main Street, Cressy

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pitt&sherry

Northern Midlands Solar Farm

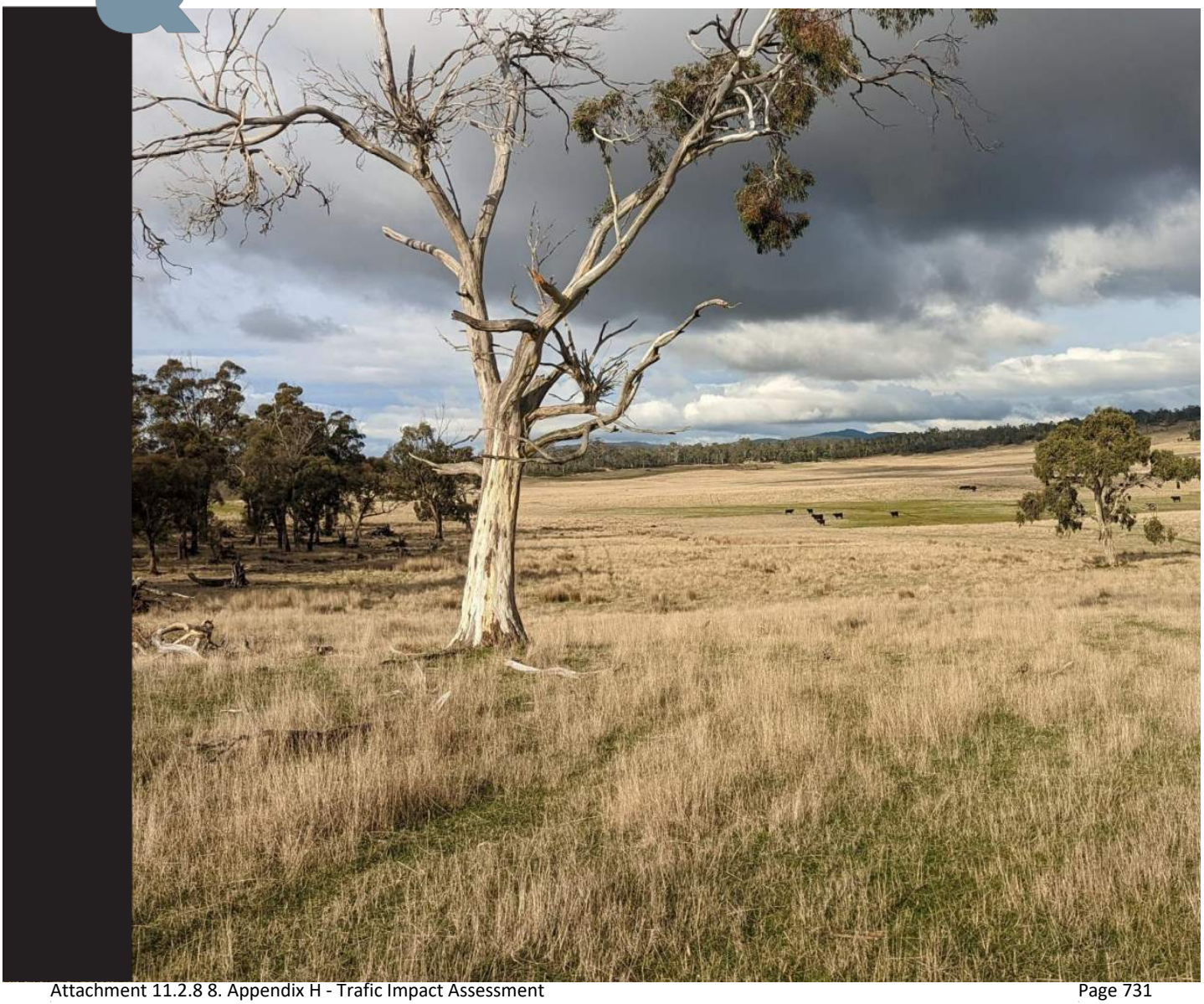
Traffic Impact Assessment

Prepared for
Connorville Estates Pty Ltd

Client representative
Emanuele Raffaele
(Robert Luxmoore Project Management)

Date
16 May 2023

Rev00



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Masterplan Page 2 Transmission Line
Masterplan Page 3 Transmission Line – Palmerston Substation
Masterplan Page 4 West Area
Masterplan Page 5 East Area

Prepared by — Sandra Diaz		**Date —** 11 May 2023
Reviewed by — Rebekah Ramm		**Date —** 11 May 2023
Authorised by — Rebekah Ramm		**Date —** 11 May 2023

Revision History

Rev No.	Description	Prepared by	Reviewed by	Authorised by	Date
A	Draft Traffic Impact Assessment	SJD	RLR	RLR	12/12/2022
B	Updated to reflect client comments	SJD	RLR	RLR	21/02/2023
C	Updated for DA lodgement	SJD	RLR	RLR	11/05/2023
00	Final for client	SJD	RLR	RLR	16/05/2023

1. Introduction

1.1 Background

Connorville Estates Proprietary Limited proposes to develop part of Connorville Station, located at 394 Connorville Road, Cressy, into a Solar Farm with a nominal yield of 288MW DC. The agrisolar concept combines agricultural sheep grazing with solar energy production by allowing grazing beneath the solar panels. The Northern Midlands Solar Farm (NMSF) also includes a new transmission line built to connect the solar farm to the existing TasNetworks transmission lines, and the provision for a battery storage facility.

1.2 Traffic impact assessment scope

Robert Luxmoore Project Management, on behalf of Connorville Estates Proprietary Limited, engaged pitt&sherry to undertake a Traffic Impact Assessment (TIA) for the NMSF.

This report has been prepared with reference to the *Tasmanian Planning Scheme – Northern Midlands* (the Planning Scheme) and in accordance with the Department of State Growth's (the department's) Publication *Traffic Impact Assessments (TIA) Guidelines.*

2. Existing conditions

2.1 Site location

The development footprint for the NMSF covers 543 ha, mostly located within the existing Connorville Station, approximately 15km east of Poatina (see Figure 1). The NMSF project includes construction of a new transmission line - three alignment options are being considered (Option 1, Option 2.1 and Option 2.2).

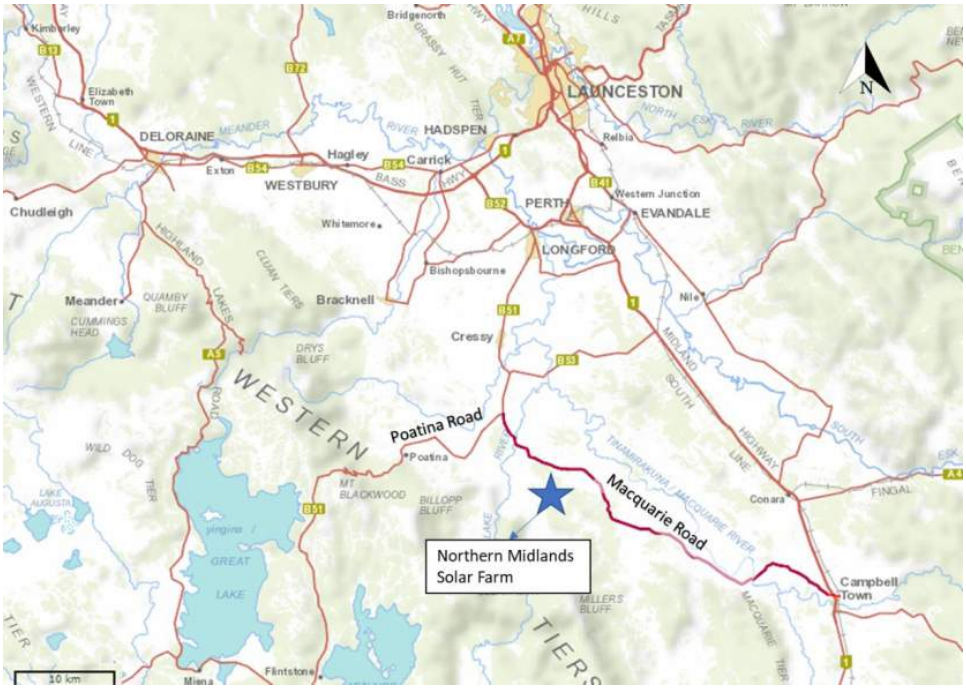

Figure 1: Connorville Station and proposed NMSF Site Location

The site has a land use classification of 21.0 – Agriculture under the Planning Scheme and all surrounding land is zoned the same. The Palmerston Substation has a land use of 26.0 – Utilities.

Connorville Station comprises Connorville House, outbuildings, a mill and garden, and is defined as a Local Heritage Place under the Tasmanian Heritage Register. There are also some areas of the bushland on the station protected by a Conservation Covenant.

2.2 Site access

Connorville Station is currently accessed via Connorville Road, accessed from Macquarie Road, near the western side of the property. Connorville Road is a Northern Midlands Council (Council) owned two-way local road for the initial 1.1km from Macquarie Road. South of this, Connorville Road is a privately owned access road used to access Connorville Station.

There are several existing farm access gates located along Macquarie Road. These entrances vary from unformed accesses directly onto grassed paddocks, to rough formed gravel tracks. Three of these farm entrances and the Connorville Road access road are assessed in this report as potential options to be developed into site accesses for use during construction of the NMSF, as discussed in 4.1 Site access.

Palmerston Substation, where the Option 1 transmission line would be connected has a dedicated access road from Poatina Road.

Transmission line options 2.1 and 2.2 would connect into the existing 220kV line that runs north-south and connects into Palmerston Substation.

In all cases, access to the transmission line construction corridor will very likely utilise Lake River Road for construction vehicles and equipment and materials.

2.3 Surrounding road network

2.3.1 Connorville Road

Connorville Road (Figure 2) is a Council owned two-way local road. It provides access to Connorville Station from Macquarie Road with vehicles travelling 1.1km down the road to reach the station's entrance (Figure 3). It is 3.5m wide with unsealed shoulders on both sides. It does not provide cycling or pedestrian facilities on either side of the road.

Connorville Road is subject to low traffic volumes. The speed limit is not signed however due to the narrow nature of the road, speeds would be slow.

Figure 2: Connorville Road, viewed to the south from Macquarie Road

Figure 3: Connorville Road viewed to the south from entrance to Connorville Station

2.3.2 Macquarie Road

Macquarie Road (shown in Figure 4 and Figure 5) is a Council owned collector road[1] which spans across the Northern Midlands from Campbell Town (junction with West Street/ Pedder Street) to Cressy (junction with Poatina Road/ Cressy Road). Macquarie Road is a two-way road configured with a single lane in each direction. Macquarie Road is approximately 6m wide with 0.5-1m gravel shoulders on both sides and typically no centre or edge lines. It does not provide cycling or pedestrian facilities on either side of the road.

Macquarie Road is subject to the Tasmanian Sealed Rural Road speed limit of 100km/h. Latest traffic count data recorded in the vicinity of the site counted 350 vehicles per day[2] (2016) at the Lake River bridge just north of the Connorville Station site. This is the most recent traffic count Northern Midlands Council could provide on Macquarie Road. Poatina road has a permanent counter installed which gives confidence in trends and patterns on the network.

[1] Based on the LIST Road Centrelines Transport Class.
[2] Daily traffic volumes provided by Northern Midlands Council.

Figure 4: Macquarie Road, looking east

Figure 5: Macquarie Road, looking west

2.3.3 Poatina Road

Poatina Road is a Department of State Growth (State Growth) Category 4 road under the State Road Hierarchy, and has a speed limit of 100km/h. The road carries approximately 406 vehicles per day (2021), of which 17% are heavy vehicles. Poatina Road forms part of the Tasmanian 26 metre B-double network. Poatina Road would be used to access the Palmerston Substation for construction of new transmission line (Option 1) for the NMSF project.

2.3.4 Lake River Road

Lake River Road is a Council owned collector road[3] which loosely follows along Lake River from Macquarie Road south into the Great Western Tiers. Lake River Road is a two-way road configured with a single lane in each direction with a speed limit of 100km/h. It does not provide cycling or pedestrian facilities on either side of the road.

Lake River Road would be used for construction access to proposed transmission line alignments Option 1, 2.1 or 2.2. The area of interest (northern end) is approximately 6m wide with 0.5-1m unsealed shoulders and no centre or edge lines.

2.3.5 Cressy Road

Cressy Road is a State Growth arterial road which connects Macquarie Road to major northern transport routes. Cressy Road is part of the B-double network and has a speed limit of 100km/h and carries approximately 1,359 vehicles per day (2021) with 22% heavy vehicles.

2.3.6 Illawarra Road

Illawarra Road links between Midland Highway and Bass Highway and is part of the Tasmanian State Highway network. Illawarra Road will link incoming traffic from Bass Highway in the west, and from Launceston (via Midlands Highway) in the east to Cressy Road and be part of the key transport routes for the NMSF project.

2.3.7 Bass Highway

The Bass Highway is a State Growth road classified as a Primary Freight and Passenger Road (Category 1) in the State Growth Road Hierarchy. It spans from Launceston to the northwest of Tasmania and provides primary transport links to the ports of Burnie and Devonport.

[3] Based on the LIST Road Centrelines Transport Class.

2.3.8 Pedder Street

Pedder Street is the eastern continuation of Macquarie Road through the urban area of Campbell Town and links Macquarie Road to the Midland Highway. Pedder Street is a 5m wide sealed road with unsealed shoulders and a speed limit of 60km/h.

2.3.9 Midland Highway

The Midland Highway (shown in Figure 6 and Figure 7) is a State Growth Road, classified as a Primary Freight and Passenger Road (Category 1) in the State Growth Road Hierarchy, and spans from Launceston to Hobart. It is a two-way highway with a varying number of lanes in each direction and operates predominantly in a north-south direction. The highway is approved for B-double usage.

The Midland Highway has a speed limit of 110km/h for much of its duration. North of Campbell Town, the highway carries approximately 6,534 vehicles per day, of which 20% are heavy vehicles.

Figure 6: Midland Highway approaching Campbell Town facing north.

Figure 7: Midland Highway south of Campbell Town facing south.

2.4 Traffic volumes

Northern Midlands Council provided data of a traffic count undertaken in 2016 on Macquarie Road at Lake River bridge, to the north of the proposed NMSF development. Traffic volumes of 350 vehicle movements per day were counted, with 16% heavy vehicles recorded.

In order to estimate 2023 traffic volumes on Macquarie Road, a compounding growth rate of 3% per year has been applied to the available traffic data, resulting in an estimated Average Annual Daily Traffic (AADT) for 2023 of 430 vehicles per day. The growth rate was based on the *Department of State Growth's traffic data website* (Traffic Data website) recorded at the Poatina Road traffic counter in the vicinity of the site. It is noted that seasonal variations were not accounted for in traffic volume or proportion of heavy vehicles.

Poatina Road traffic volumes were estimated using the data available from the Traffic Data website. A continuous classified traffic counter is located on Poatina Road just west of the Palmerston Substation and shows AADT for 2021 of 406 vehicles per day with 17% heavy vehicles. Applying a compounding growth rate of 3% per year the AADT for 2023 is estimated to be 431 vehicles per day.

An increase in the percentage of heavy vehicles has been observed at the Poatina Road station and based on this we have estimated the 2023 heavy vehicle percentage to be approximately 18% on Poatina Road and approximately 20% on Macquarie Road.

Based on the available traffic data, it was noted that the weekday AM peak hour for Poatina Road (Nov 2021) is between 11:00am and 12:00pm and the PM peak hour is between 3:00pm and 4:00pm. These weekday peak times will be adopted for this assessment.

A summary of the estimated current traffic parameters in the vicinity of the NMSF site, are shown below in Table 1.

Table 1: 2022 traffic estimates

Location	AADT	% Heavy Vehicles	AM peak volume (AM peak hour)	PM peak volume (PM peak hour)
Macquarie Road	430	20 %	33 (11.00am – 12.00pm)	35 (3.00pm – 4.00pm)
Poatina Road	431	18 %	33 (11.00am – 12.00pm)	35 (3.00pm – 4.00pm)

2.5 Road safety

2.5.1 Crash history

State Growth has provided crash data for Macquarie Road in the vicinity of the proposed NMSF development. The data provided was for a 10-year period. A summary of the crash data is included in Table 2, below.

Table 2: Crash history on Macquarie Road in the vicinity of the proposed development

Crash Severity	Crash Type	Count
Property Damage Only	167 - Animal (not ridden)	1
	179 - Other straight	1
	184 - Out of control on carriageway	1
	unknown	1
Minor	167 - Animal (not ridden)	1
	173 - Right off carriageway into object or parked vehicle	2
	183 - Off left bend into object/parked vehicle	1
Serious	149 - Other manoeuvring	1

The crash history shows that nine crashes have occurred on Macquarie Road in the vicinity of Connorville Station and the proposed NMSF development in past 10 years, which is less than one crash per year. All crashes were single vehicle crashes, no serious crashes have been recorded since 2015, and the data does not indicate any crash patterns of concern.

3. Development proposal

3.1 Overview

The NMSF project is located at 394 Connorville Road, Cressy (see Figure 8 below). The concept is to install 432.3 ha of single-axis tracking solar panels to achieve solar generation of approximately 288MW DC, and inverters, solar farm substation and new transmission line to integrate the generated energy to the existing TasNetworks grid, along with the provision for a battery storage facility. The transmission line alternatives are shown in magenta (Option 1), yellow (Option 2.1) and cyan (Option 2.2) in Figure 8, with one of these alignments to be chosen.

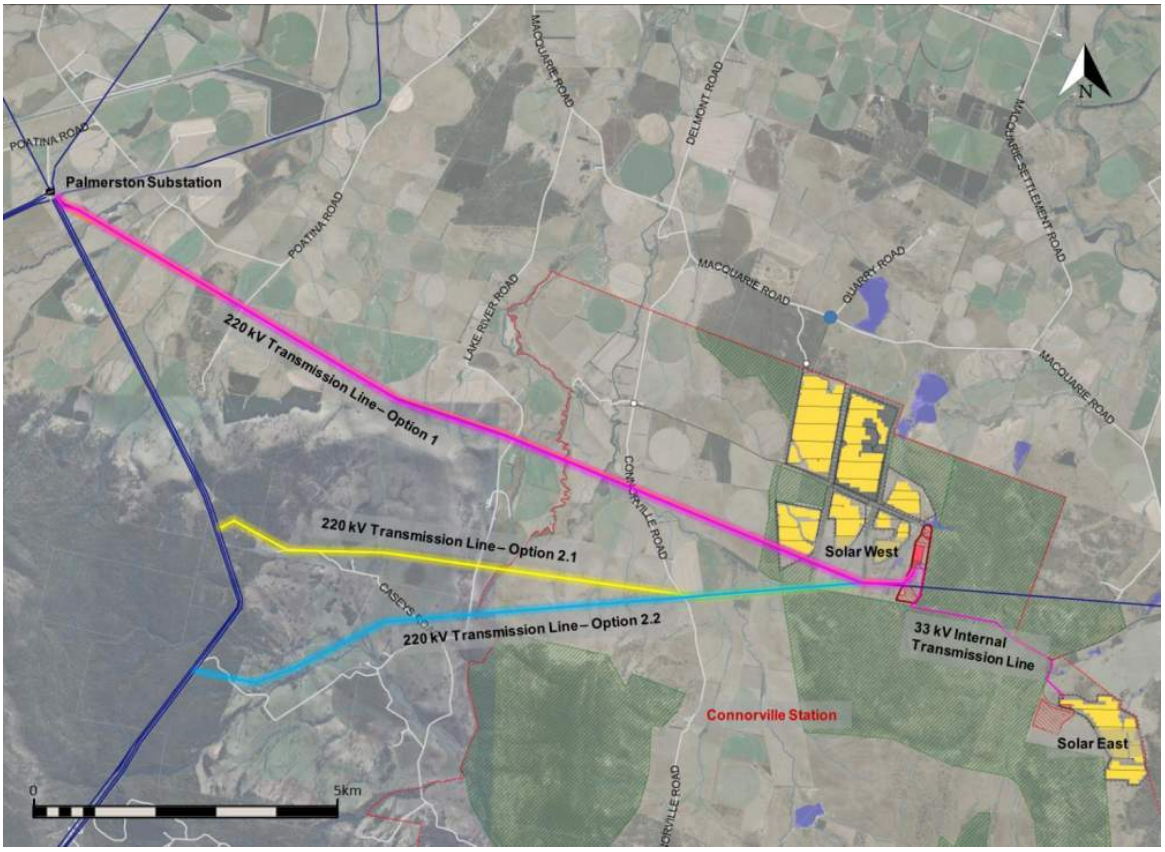

Figure 8: Proposed Northern Midlands Solar Farm layout

Construction of the solar farm will involve:

- Bulk earthworks, access tracks, and hardstands for construction laydown and car parking areas
- Installation of solar panel arrays in Solar East and Solar West areas
- Infrastructure area including switchyard, battery energy storage system (BESS), and operations and maintenance compound
- 33KV internal transmission line linking Solar East and Solar West areas
- One new 220kV transmission line including poles/towers and line; and
- new connection at the Palmerston Substation (Option 1) or into existing 220kV line (Options 2.1 and 2.2).

3.2 Staff and Site Operation

Construction of the NMSF is estimated to take 18 months and involve up to 270 workers onsite for the solar farm construction at the peak,[4] plus an additional 50 workers involved in the transmission line, substation connection, BESS and switchyard components.

Working hours at site are 7.00am – 6.00pm, Monday-Friday, 8.00am – 6.00pm Saturday and 10am – 6pm public holidays or Sunday. Employees are expected to carpool or be bused in and out at the start and end of the day with most vehicles coming from Launceston. Deliveries will be expected throughout the day.

3.3 Post construction

Once construction is complete and the solar farm is operational, the ongoing access requirements will reduce dramatically.

Onsite functions relating to the solar operation will require minimal staff. Operational jobs are estimated at 11 direct jobs[5]. The agricultural operations of the station will continue similar to prior construction of the solar farm.

4. Construction phase assessment

4.1 Site access

The existing access and egress to Connorville Station is from Connorville Road, and the continuing private road. For the NMSF development, this will be utilised as a secondary/emergency access. Two existing farm access gates along Macquarie Road are proposed to be developed into main access points (Access #1 and Access #2), and a third will be an additional secondary/emergency access for NMSF (Access #3). The proposed accesses are shown in Figure 9, below.

The construction corridor for the new transmission line (Option 1, 2.1 or 2.2) will require temporary access tracks via private properties which will be explored as part of the detailed design and will be included as part of the options agreements with the transmission landowners along the chosen alignment. Access to the construction corridor will utilise Lake River Road and Poatina Road for construction vehicles and equipment and materials. The connection to Palmerston Substation will utilise the existing Palmerston Substation access road off Poatina Road.

Multiple site accesses will allow convenient access to each area of the site for different construction activities.

[4] Client data based on similar sized projects.
[5] Extracted from draft Urban Enterprise SocioEconomic report.

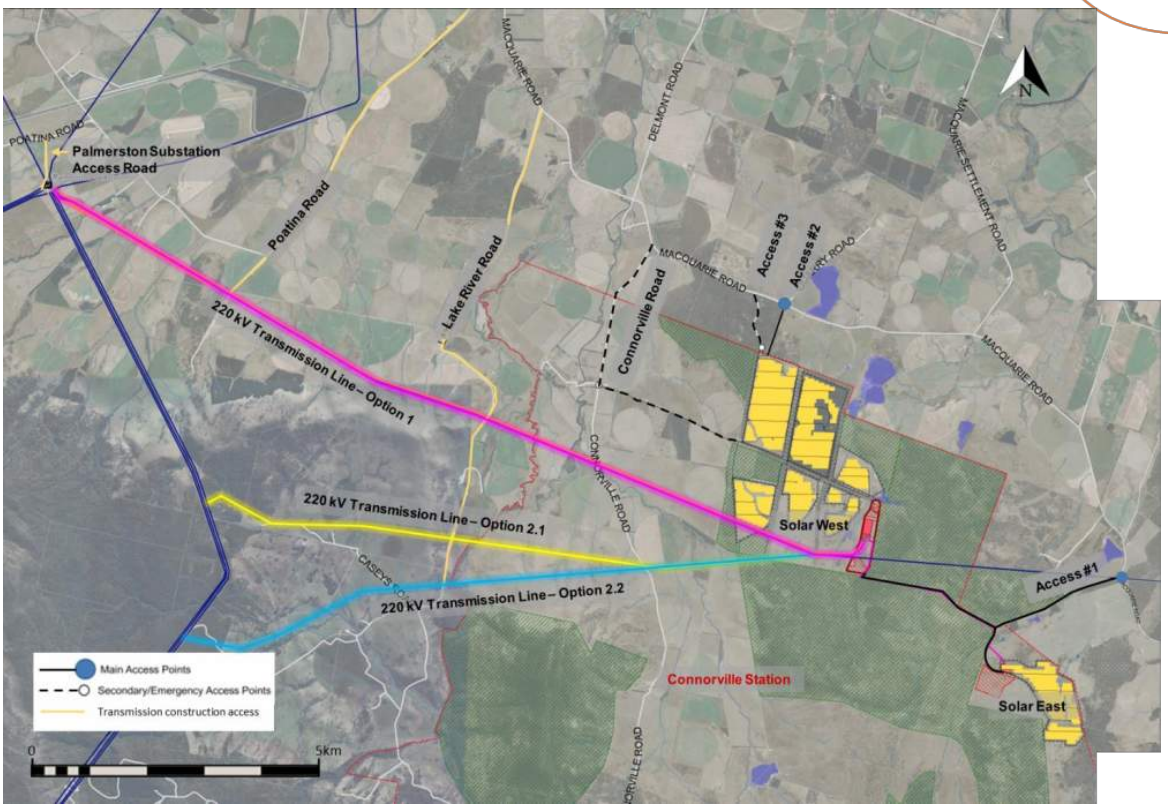

Figure 9: NMSF site accesses

4.2 Construction site access suitability

pitt & sherry visited the NMSF area on Tuesday 25 October 2022 and inspected the proposed site accesses for suitability. Observations are summarised below, ordered east to west.

4.2.1 Access #1 – Proposed Main access

The existing access is a roughly formed farm track. It joins Macquarie Road just past a sweeping bend but has good sight distance in both directions.

Figure 10: Access #1 entrance

Figure 11: Macquarie Rd, west approach to Access #1

Figure 12: Macquarie Rd, east approach to Access #1

4.2.2 Access #2 – Proposed Main access

Access #2 is a farm entrance providing paddock access. It joins Macquarie Road on a long straight and has good sight distance in both directions

Figure 13: Access #2 entrance

Figure 14: Macquarie Rd, west approach to Access #2

Figure 15: Macquarie Rd, east approach to Access #2

4.2.3 Access #3

– Proposed Secondary/Emergency access

Access #3 is a private unsealed access road. It joins Macquarie Road on a long straight and has good sight distance in both directions.

Figure 16: Access #3 entrance

Figure 17: Macquarie Rd, west approach to Access #3

Figure 18: Macquarie Rd, east approach to Access #3

4.2.4 Connorville Road

– Proposed Secondary/Emergency access

Connorville Road is a narrow 3.5m sealed country lane. It joins Macquarie Road at a sweeping bend but has good sight distance in both directions.

Figure 19: Connorville Rd entrance

Figure 20: Macquarie Rd, west approach to Connorville Rd

Figure 21: Macquarie Rd, east approach to Connorville Rd

4.2.5 Lake River Road

Lake River Road is an existing Council owned local road. The 6m wide two-way sealed road has a speed limit of 100km/h.

Site distance to the west is limited to 130m by a crest on Macquarie Road.

Figure 22: Lake River Road (looking south)

Figure 23: Macquarie Rd, west approach to Lake River Road

Figure 24: Macquarie Rd, east approach to Lake River Road

4.2.6 Palmerston Substation Access Road

Palmerston Substation Access Road is a privately owned access road functioning solely to service the substation. The sealed road is in poor repair in places with numerous large potholes.

If the Palmerston Substation Access Road is intended to be used for works associated with NMSF, it is recommended that potholes be repaired prior to the commencement of the proposed works at the substation. These pavement defects are likely to worsen with increased use and may pose a safety hazard.

Figure 25: Palmerston Substation Access Road (looking south)

Figure 26: Poatina Rd, west approach to Palmerston Substation Access Rd

Figure 27: Poatina Rd, east approach to Palmerston Substation Access Rd

4.2.7 Access and Sight Distance suitability

Existing access road widths are shown in Table 3 below. Sufficient turning areas should be provided for all vehicles to enter and exit the site in a forward direction.

The required access width for an articulated vehicle (such as a semi-trailer or a B-double truck) is a 10m access plus a 10m exit separated by a 1.5m minimum median as per *AS2890.2 Off-street commercial vehicle facilities.* If it is necessary to make the access or exit narrower, swept paths must be completed for the largest vehicle accessing the site to confirm that a vehicle can turn into and out of the site in a forward direction.

The Safe Intersection Sight Distance (SISD) has been assessed for each proposed site access in accordance with the *Austroads Guide to Road Design – Part 4A: Unsignalised and Signalised Intersections*. The speed limits on Macquarie Road and Poatina Road are 100km/h resulting in a required sight distance of 248m.

Table 3: Summary of Site Accesses

Access	Road width	Sight distance west	Sight distance east
Access #1	To be constructed at 4m	>250m	>250m
Access #2	To be constructed at 4m	>250m	>250m
Access #3	4m	>250m	>250m
Connorville Road	3.5m	>250m	>250m
Lake River Road	6m	130m	>250m
Palmerston Substation Access Road	4.5m	>250m	>250m

As shown in the summary of sight distances observed on site (see Table 3, above) all accesses meet the required SISD of 248m except for Lake River Road (west).

Sight distance at the existing Lake River Road/ Macquarie Road intersection does not meet the Austroads guidelines for SISD of the west approach at the 100km/h posted speed limit. It is worth noting that Lake River Road will very likely be utilised as a construction access for the installation of the new transmission line but will not be required as an access for the ongoing operations of NMSF.

Increasing the site distance for eastbound traffic, would require major works to remove the crest of the hill and reform the road. As the increase in traffic from NMSF construction is only expected to last 18 months, it may be considered unnecessary to undertake such a major remediation. To increase the safety of the Lake River Road/ Macquarie Road intersection, consideration should be given to installing an advisory Side Road Intersection W2-4(R) sign (Figure 28) as detailed in the *Australian Standard AS1742.2-2009 Manual of uniform traffic control devices – Part 2: Traffic control devices for general use*. Additionally, a Trucks Crossing or Entering sign may improve awareness of slow-moving heavy vehicles ahead - either entering from the Lake River Road or slowing to turn right into Lake River Road. Should the construction contractor determine the limited access is not safe for construction works even with additional signage, a Construction Traffic Management Plan proposing a lower speed limit could be prepared for the duration of the construction works.

Figure 28: Side Road Intersection Advisory Sign

Figure 29: Trucks Crossing or Entering Advisory Sign

4.3 Transport routes

4.3.1 Light vehicles

All staff vehicles will enter and exit the site via the site accesses described above. Routes taken to access the site by staff vehicles will depend on their origin, with the majority expected to travel from the north, predominantly Launceston and surrounding townships.

4.3.2 Heavy vehicles

Standard heavy vehicles

Heavy vehicles will be required for transporting materials, plant and equipment to site. Most heavy vehicles are expected to travel to and from Launceston. Resources from the mainland may also arrive by sea to Burnie or Devonport ports and travel along the Bass Highway. Any vehicles travelling to or from Hobart or south will utilise the Midland Highway.

Heavy vehicles will utilise the approved Tasmanian 26 metre B-double network of roads. The majority of vehicles accessing the site will be trucks up to the size of a 26 metre B-double. At the time of writing this report, there do not appear to be any restrictions for access using the Midland Highway, Bass Highway and Cressy Road which are approved B-double routes. This should be checked closer to the construction date including any load limits on bridges.

Macquarie Road is suitable for vehicles up to a 19m semi-trailer in size. It is recommended that if Macquarie Road is used for haulage that any bridges on the road are assessed by a structural engineer for suitability. Approval would be required for B-double trucks to use Macquarie Road.

The preferred primary transport routes for the NMSF project are shown in Figure 30, below.

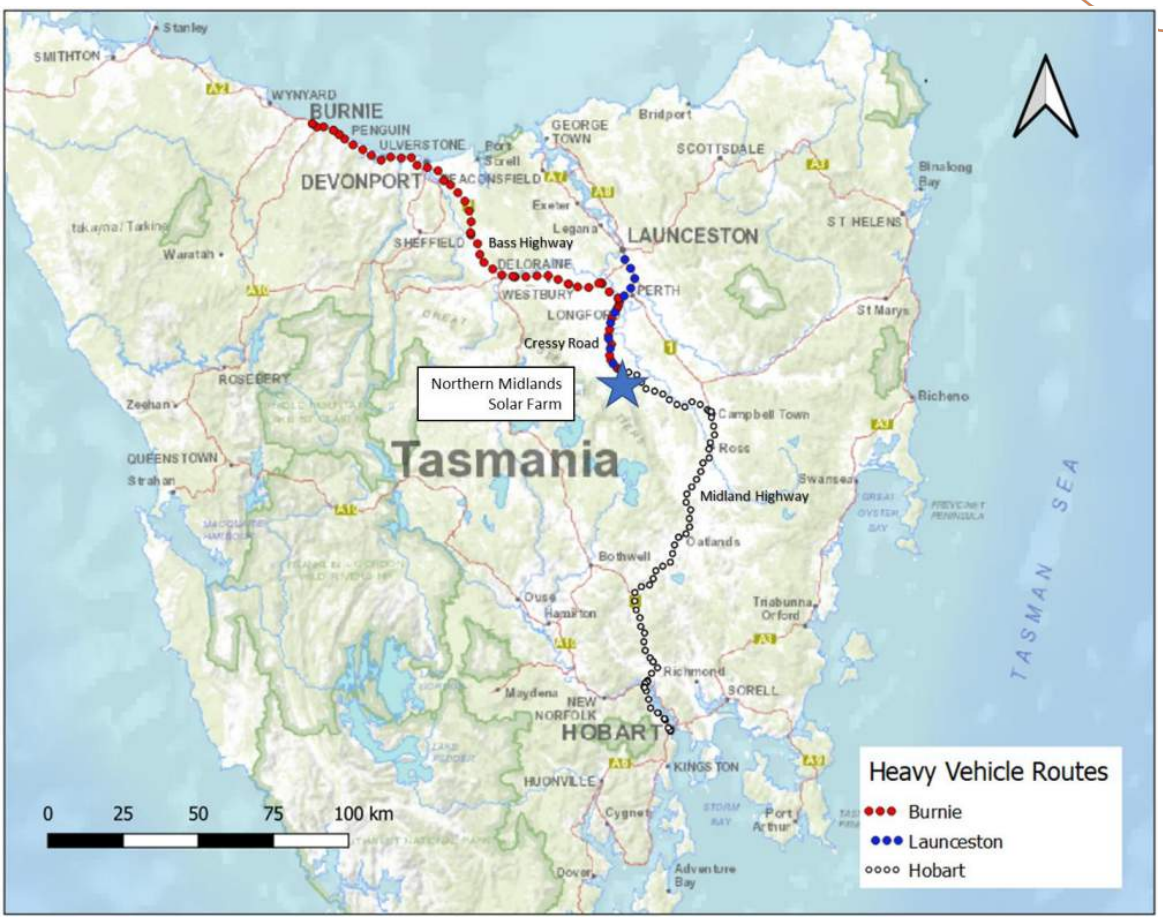

Figure 30: Heavy vehicle transport routes to site

Over Size and Over Mass (OSOM) Vehicles

The project is likely to require some materials to be transported using OSOM vehicles. The following assessments should be completed for OSOM vehicles:

- An OSOM route assessment, completed by a suitably qualified person, which assesses the suitability of routes for the proposed OSOM vehicle and if there are any modifications that are required to be made to the road and nearby infrastructure (e.g. moving powerlines, widening pavements, removing traffic islands, moving/ removing signage).
- A construction traffic management plan which considers the impact to traffic operation
- A structural assessment of any impacted bridges to determine their suitability; and
- A dilapidation report may be required for Macquarie Road.

OSOM movements should occur on the highest order roads and B-double approved routes as much as possible as shown in Figure 30.

4.4 Internal access roads

A comprehensive network of access roads is proposed and will provide access to all sections of the solar farm – see Masterplan drawings (Appendix A).

The internal roads will be all weather access tracks constructed 4m wide, to suit 20 tonne vehicles and with passing bays every 200m to allow two-way use.

Guidance has been provided below for the design of the internal access roads.

The following standards apply for access roads:

- New access roads should be developed with a width of 5.5m to provide two-way access, or minimum of 4m for one-way access (based on Tasmania Fire Service requirements);
- New access roads providing access for articulated vehicles must not exceed a grade of 1:6.5 (15.4%) and the rate of change of grade must not exceed 1:16 (6.25%) as specified in AS2890.2;
- A minimum turning radius for an articulated vehicle must not exceed 12.5m as specified in AS2890.1; and
- Swept paths should be completed along all access roads for the largest vehicle accessing the site.

4.5 Parking and unloading areas

Construction laydown/ car parking areas are proposed for both the east and west solar farm areas (see masterplan drawings, Appendix A).

The parking areas should be sized to accommodate the parking requirements at convenient locations across the site and be suitably sized for functionality. Car parking should be designed in accordance with AS2890.1 – Off street car parking. Some example parking requirements are shown in Table 4.

Table 4: Example Car Parking Requirements

Item	Employee Car Parking	Visitor Car Parking
Car parking space width	2.4m	2.5m
Car parking space length	5.4m	5.4m
Aisle width	6.2m	5.8m
Car park crossfall	1:16 (6.25%)	

The laydown areas will allow delivery vehicles to be clear of other circulating vehicles during unloading.

The ground conditions onsite have not been assessed but placing gravel hardstand areas may be required if ground is soft (especially during wetter months). If oversized or heavy loads are required, specific checks should be carried out to confirm ground capacity and prevent bogging or overturning onsite.

4.6 Traffic generation

Traffic impacts at the site are expected to predominantly occur during the construction phase. Construction of the project is estimated to take approximately 18 months. Each activity will have varying requirements for traffic access, and the client has provided estimates of traffic movements during construction, shown in Table 5 below.

Table 5: NMSF estimated construction traffic

Construction Activity	Duration	Work force	Light Vehicle	Medium Truck	Large Truck
	(weeks)	(workers per day)	(vehicle movements per day)		
Logistics	35	20	10		15
Civil	45	50	20		20
Mechanical	52	100	30	4	
Electrical	52	80	30	2	
Completion and Commission	25	20	10		
SUBTOTAL - Solar Farm		**270**	**100**	**6**	**35**
Substation and Transmission Line	25	50	20	2	7
SUBTOTAL - Energy Infrastructure		**50**	**20**	**2**	**7**
TOTAL		**320**	**120**	**8**	**42**

Construction activities will overlap, so for the purposes of this traffic impact assessment we have assumed each activity occurs concurrently and based the peak construction traffic generation on the total of all stages. This is a conservative approach, as it is more likely that demands from each stage will be staggered. Demands from different activities will also be distributed spatially across the site.

4.6.1 Traffic distribution and directional split

It has been assumed that light vehicles will predominantly access the site between 6:00am and 7:00am in the morning before the 7:00am start, and egress the site between 6:00pm and 7:00pm, based on typical construction site operation, Monday to Friday. Similarly on Saturdays light vehicles are assumed to predominantly arrive in the hour before work commences onsite at 8:00am, and egress in the hour after work finishes at 6:00pm, and on Sundays or public holidays light vehicles will access from 9:00am to 10:00am and egress from 6:00pm-7:00pm.

It has been assumed that trucks will access and egress the site throughout the day from 7:00am to 6:00pm weekdays and 8.00am – 6.00pm Saturday and 10am – 6pm public holidays or Sunday.

4.7 Traffic impacts – during construction

The traffic impact of the construction phase of the NMSF development has been assessed based on the following assumptions:

- A growth rate of 3% per year has been applied to the recorded traffic volumes along Macquarie Road and Poatina Road to calculate existing traffic volumes (see Section 2.4)
- No other significant developments are known in the immediate vicinity of the site within the foreseeable future; and
- Construction staff would travel to and from the site outside the current peak times and therefore would not contribute to the current peak hour traffic flows.

120 light vehicle movements plus approximately 50 medium and heavy vehicle movements are estimated to and from the site per day during peak construction. 170 additional vehicle movements per day on Macquarie Road would represent an increase in daily traffic volumes of 40%. The Planning Scheme states that the maximum acceptable increase in AADT from vehicles travelling to and from site is 40 light vehicle movements per day and 5 vehicle movements per day of vehicles longer than 5.5m (as per Table C3.1 of the Planning Scheme). The estimated traffic generated by the proposed NMSF development exceeds this criteria.

The local road network is comprised of rural roads with low existing traffic flows operating well below capacity. It is not anticipated that the additional traffic produced by the NMSF development during the construction phase will negatively impact the function or safety of the local network.

Heavy vehicle flows are likely to be spread across the day and the contribution to the AM and PM peak flows is estimated to be small (6 heavy vehicles per hour).

Light vehicle movements are likely to occur clustered, with 50% arriving 6:00am-7:00am and 50% departing 6.00pm-7.00pm, coinciding with the hours of operation of the construction site. 60 additional light vehicle movements plus 6 heavy vehicles concentrated within an hour period is significant. The current AM and PM peaks on Macquarie Rd are 33 and 35 vehicles per hour. Therefore, NMSF construction traffic will generate new peak hours on the local network during the construction period. Maximum peak flows are estimated to be 60 vehicles per hour from 6:00am – 7:00am and 66 vehicles per hour from 6:00pm – 7:00pm respectively, but actual peaks may be lower if staff work hours vary and start and finish times are staggered for different work crews.

4.8 Vehicle turning

The network of internal roads will ensure all vehicles can access site and turn around to safely egress site in a forward direction. Detailed road design has not been documented to date and swept paths have not been assessed for the internal access roads.

Due to the size of the site, it is expected there will be sufficient space for vehicles to turn around on site within the solar farm and infrastructure area footprint.

Vehicle turning paths should be assessed once detailed design plans for the site are prepared.

5. Operational phase assessment

5.1 Traffic generation

As outlined previously, operation of the solar farm requires very little labour. Once construction is complete, the ongoing access requirements will reduce dramatically. Onsite functions relating to solar operations are limited to servicing and maintenance and the agricultural operations of the station will continue similar to prior construction of the solar farm.

The ongoing operation of the solar farm is estimated to generate $36 million in total economic output and support 27 (FTE) jobs per annum, which includes 11 direct jobs (FTE)[6]. As a conservative estimate we have assumed 10-20 vehicle movements per day are generated by the site post-development.

5.2 Access suitability

Given the significantly smaller traffic volumes anticipated during operations compared with during construction, it is assumed that the construction site accesses established for construction access will more than adequately meet the site's ongoing operational requirements.

It is worth noting that Lake River Road, which has reduced site distance to the west at the intersection with Macquarie Road, is utilised as a construction access for the installation of the new transmission line but will not be required as an access for the ongoing operations of NMSF.

5.3 Traffic impacts – post-development

The impact of traffic generated by the ongoing operation of the NMSF development is expected to be minimal during both the AM and PM peak hours and throughout the day.

The 10-20 daily vehicle movements to and from the site will likely occur earlier than the current AM peak (11:00am-12:00pm) or later than the PM peak (3:00pm-4:00pm). Heavy vehicles required to access or egress the site, post construction, are expected to be negligible.

The additional traffic generated by the development post-construction represents less than 5% of the existing traffic on Macquarie Road and is not expected to impact the function or operation of the surrounding network or affect the existing crash risk.

5.4 Turning treatments

It is not considered necessary to provide left or right turn treatments at the property accesses for the following reasons:

- There are low traffic volumes on Macquarie Road
- The proposed development will generate traffic volumes that can be safely accommodated on the existing roads during the 18 months of construction and very low traffic volumes in the operational phase; and
- There is good sight distance at all proposed access points, plus inclusion of warning signage for Lake River Road where sight distance is limited.

[6] Extracted from draft Urban Enterprise SocioEconomic report.

6. Planning Scheme Assessment

6.1 C3.0 Roads and Railway Assets Code

The NMSF development has been assessed against the Use Standards of the *Tasmanian Planning Scheme – Northern Midlands* (the Planning Scheme) Roads and Railway Assets Code, shown below in Table 6.

Table 6: Road and Railway Assets Code - Use Standards

C3.5.1 Traffic generation at a vehicle crossing, level crossing or new junction	
Objective: To minimise any adverse effects on the safety and efficiency of the road or rail network from vehicular traffic generated from the site at an existing or new vehicle crossing or level crossing or new junction.	
Acceptable Solution	**Comment**
A1.1 For a category 1 road or a limited access road, vehicular traffic to and from the site will not require: a) A new junction; b) A new vehicle crossing; or c) A new level crossing. **A1.2** For a road, excluding a category 1 road or a limited access road, written consent for a new junction, vehicle crossing, or level crossing to serve the use and development has been issued by the road authority. **A1.3** For the rail network, written consent for a new private level crossing to serve the use and development has been issued by the rail authority. **A1.4** Vehicular traffic to and from the site, using an existing vehicle crossing or private level crossing, will not increase by more than: a) The amounts in Table C3.1; or b) Allowed by a licence issued under Part IVA of the Roads and Jetties Act 1935 in respect to a limited access road. **A1.5** Vehicular traffic must be able to enter and leave a major road in a forward direction.	**Complies with acceptable solution A1** The A1 criteria are addressed below. 1.1. Macquarie Road and Poatina Road are not Category 1 or limited access roads. 1.2. The NMSF project will make use of existing access points to Connorville Station and therefore will not create any new junctions or access points. 1.3. No rail in the vicinity - not applicable 1.4. Amount of increase in annual average daily traffic to and from the site is conservatively estimated to be 10-20 vehicle movements per day (post-development) which is 5% increase to existing volumes on Macquarie Road and satisfies criteria of Table C3.1 of 20% for other roads. During construction daily vehicle movements are estimated at 120 light vehicles and 50 heavy vehicles. These increases exceed the criteria of Table C3.1 of 20% for other roads, however given that the surrounding roads are currently operating well below capacity the additional traffic associated with the development is not anticipated to adversely affect the functioning or safety of the local network, for the relatively short period of construction (18 months). 1.5. The proposed network of internal access roads will enable all vehicles to turn around on site.

6.2 C2.0 Parking and Sustainable Transport Code

The NMSF development has been assessed against the Use Standards and Development Standards of the *Tasmanian Planning Scheme – Northern Midlands* (the Planning Scheme) Parking and Sustainable Transport Code, shown below in Table 7 and Table 8, respectively.

Table 7: Parking and Sustainable Transport Code – Use Standards

C2.5.1 Car parking numbers	
Objective: To ensure that an appropriate level of car parking spaces are provided to meet the needs of the use.	
Acceptable Solution	**Comment**
Acceptable Solution A1 The number of on-site car parking spaces must be no less than the number specified in Table C2.1	**Complies with Acceptable Solution A1** Utilities Use Class – there is no requirement for car parking spaces (as per Table C2.1) The site is large and there is expected to be sufficient space for all vehicles associated with the NMSF to park.

C2.5.2 Bicycle parking numbers	
Objective: To ensure that an appropriate level of bicycle parking spaces are provided to meet the needs of the use.	
Acceptable Solution	**Comment**
Acceptable Solution A1 Bicycle parking spaces must: a) Be provided on the site or within 50m of the site; and b) Be no less than the number specified in Table C2.1.	**Complies with Acceptable Solution A1** Utilities Use Class – there is no requirement for bicycle parking spaces (as per Table C2.1) Likelihood of travel to site by bicycle is considered unlikely.

C2.5.3 Motorcycle parking numbers	
Objective: To ensure that an appropriate level of motorcycle parking spaces are provided to meet the needs of the use.	
Acceptable Solution	**Comment**
Acceptable Solution A1 The number of on-site motorcycle parking spaces for all uses must: a) Be no less than the number specified in Table C2.4; and	**Complies with Acceptable Solution A1** Utilities Use Class – there is no requirement for motorcycle parking spaces (as per Table C2.4) The site is large and there is expected to be sufficient space for any motorcycles associated with the NMSF to park.

b) If an existing use or development is extended or intensified, the number of on-site motorcycle parking spaces must be based on the proposed extension or intensification, provided the existing number of motorcycle parking spaces is maintained.	

C2.5.4 Loading bays

Objective:

That adequate access for goods delivery and collection is provided, and to avoid unreasonable loss of amenity and adverse impacts on traffic flows.

Acceptable Solution	Comment
Acceptable Solution A1 A loading bay must be provided for uses with a floor area of more than 1000m² in a single occupancy.	**Complies with Acceptable Solution A1** The NMSF development does not have a floor area of >1000m^2, therefore no requirement applies. However, as the site is large there is expected to be sufficient space for required vehicle loading.

Table 8: Parking and Sustainable Transport Code – Development Standards

C2.6.1 Construction of parking areas

Objective:

That parking areas are constructed to an appropriate standard.

Acceptable Solution	Comment
Acceptable Solution A1 All parking, access ways, manoeuvring and circulation spaces must: a) Be constructed with a durable all-weather pavement; b) Be drained to the public stormwater system, or contain stormwater on the site; and c) Excluding all uses in the Rural Zone, Agriculture Zone, Landscape Conservation Zone, Environmental Management Zone, Recreation Zone and Open Space Zone, be surfaced by a spray seal, asphalt, concrete, pavers or equivalent material to restrict abrasion from traffic and minimise entry of water to the pavement.	**Complies with Acceptable Solution A1** Access ways, parking areas and turning areas etc, will be required to be suitably constructed including appropriate drainage, and well maintained to ensure all weather access to site, particularly throughout the wetter months. NMSF is in an Agriculture zone and therefore sealing of the access ways is not required.

C2.6.2 Design and layout of parking areas

Objective:

That parking areas are designed and laid out to provide convenient, safe and efficient parking.

Performance Criteria	Comment
Performance Criteria P1 All parking, access ways, manoeuvring and circulation spaces must be designed and readily identifiable to provide convenient, safe and efficient parking, having regard to: a) The characteristics of the site; b) The proposed slope, dimensions and layout; c) Useability in all weather conditions; d) Vehicle and pedestrian traffic safety; e) The nature and use of the development; f) The expected number and type of vehicles; g) The likely use of the parking areas by persons with a disability; h) The nature of traffic in the surrounding area; i) The proposed means of parking delineation; and j) The provisions of Australian Standard AS 2890.1:2004 - Parking facilities, Part 1: Off-street car parking and AS 2890.2 -2002 Parking facilities, Part 2: Off-street commercial vehicle facilities.	**Satisfies Performance Criteria P1** Details of the parking layout, and construction details of access ways have not been provided by the client. However, the sites size and topography are such that satisfying the performance criteria should be achievable.

C2.6.3 Design and layout of parking areas

Objective:

That:

(A) Access to land is provided which is safe and efficient for users of the land and all road network users, including but

(B) Accesses do not cause an unreasonable loss of amenity of adjoining uses; and

(C) The number of accesses minimise impacts on the streetscape.

Acceptable Solution	Comment
Acceptable Solution A1 The number of accesses provided for each frontage must: a) Be no more than 1; or b) No more than the existing number of accesses, whichever is the greater.	**Complies with Acceptable Solution A1** The NMSF project will make use of existing access points to Connorville Station and therefore will not create any new access points.

C2.6.5 Pedestrian access

Objective:

That pedestrian access within parking areas is provided in a safe and convenient manner.

Performance Criteria	Comment
Performance Criteria P1 Safe and convenient pedestrian access must be provided within parking areas, having regard to: a) The characteristics of the site b) The nature of the use c) The number of parking spaces d) The frequency of vehicle movements e) The needs of persons with a disability f) The location and number of footpath crossings g) Vehicle and pedestrian traffic safety h) The location of any access ways or parking aisles; and i) Any protective devices proposed for pedestrian safety.	**Satisfies Performance Criteria P1** Details of parking layout and pedestrian accesses have not been provided by the client. However, the sites size is such that satisfying the performance criteria should be achievable.

C2.6.6 Loading bays

Objective:

That the area and dimensions of loading bays are adequate to provide safe and efficient delivery and collection of goods.

Performance Criteria	Comment
Performance Criteria P1 Loading bays must have an area and dimensions suitable for the use, having regard to: a) The types of vehicles likely to use the site b) The nature of the use c) The frequency of loading and unloading d) The area and dimensions of the site e) The topography of the site f) The location of existing buildings on the site; and g) Any constraints imposed by existing development.	**Satisfies Performance Criteria P1** Laydown areas are shown in the development masterplans within the Solar East and Solar West areas. They have been sized and located to accommodate deliveries of plant and equipment by heavy vehicles. The topography of the site is flat and the laydowns will ensure loading and unloading can occur clear of circulating vehicles on the access roads.
Acceptable Solution A2 The type of commercial vehicles likely to use the site must be able to enter, park and exit the site in a forward direction in accordance with *Australian Standard AS 2890.2 – 2002, Parking Facilities, Part 2: Parking facilities Offstreet commercial vehicle facilities.*	**Complies with Acceptable Solution A1** The site's size and accesses provide sufficient space for commercial vehicles to enter, park, turn and exit the site in a forward direction.

7. Conclusion

Robert Luxmoore Project Management, on behalf of Connorville Estates Proprietary Limited, engaged pitt&sherry to undertake a Traffic Impact Assessment for the Northern Midlands Solar Farm. The analysis and discussion presented in this TIA report can be summarised as follows:

- The crash history for Macquarie Road in the vicinity of the site is consistent with that of a rural road with no crash patterns of concern observed
- The sight distance to the west of the Lake River Road/ Macquarie Road intersection does not meet the Austroads requirements
- The sight distances of all other proposed accesses meet the Austroads requirements
- The proposed transport route is expected to have sufficient capacity to accommodate the additional traffic generated during construction of the proposed development; and
- Operational traffic volumes of NMSF are estimated to be minimal and are not expected to have any noticeable impact to the safety and function of the surrounding road network after construction.

Recommendations:

To mitigate the hazard caused by reduced sight distance at the Lake River Road/ Macquarie Road intersection, it is recommended that advisory Side Road Intersection (W2-4(R)) and Trucks [crossing or entering] (T2-25) signage be erected prior to the crest west of the intersection to alert vehicles travelling eastbound

It is recommended that potholes on Palmerston Substation Access Road be repaired prior to the commencement of any works at the substation as these pavement defects are likely to worsen with increased use and may pose a safety hazard

Provide sufficient parking for staff and delivery vehicles within the temporary construction compounds, including a loading area which allows delivery vehicles to be clear of other circulating vehicles during unloading

Any vehicles greater than 26m B-double will require additional consideration and should have an approved Traffic Management Plan detailing the trip route and specifics, or a permit (as required).

Important information about your report

In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints. The Report may only be used and relied on by the Client for the purpose set out in the Report. Any use which a third party makes of this document, or any reliance on or decisions to be made based on it, is the responsibility of the Client or such third parties.

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Master Plans

Appendix A

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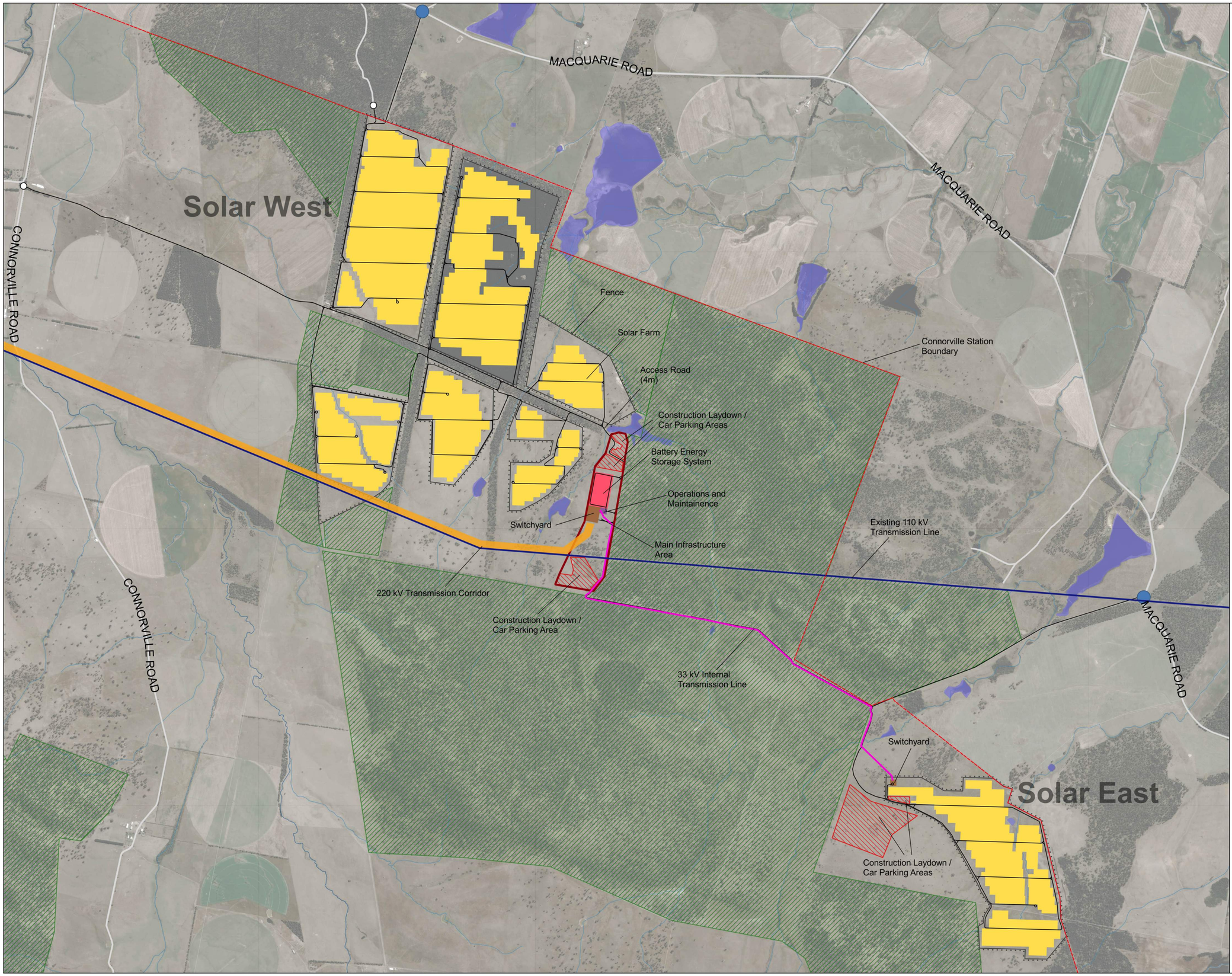


cogency

ROBERT LUXMOORE
Project Management

Masterplan Page 1
Overall Area

2210 - Northern Midlands Solar Farm

Existing Features
- Parcels
- Existing Roads
- Conservation Covenant and Greening Australia Reserves
- Dams
- Watercourse
- 110 kV Exsting Transmission Line

Proposed Development
- Connorville Station
- Access Roads
- Solar Farm
- Main Infrastructure Area
- Battery Energy Storage System
- Operations and Maintainence
- Swtichyard
- Construction Laydown / Car Parking Area
- 220 kV Transmission Corridor
- 33 kV Internal Tranmission Line
- Fence
- Main Access Points
- Secondary/Emergency Access Points

Version: 5

Date: 21/04/2023

0 250 500 m

1:13,000 at A1

cogency

ROBERT LUXMOORE
Project Management

Masterplan Page 2
Transmission Line

2210 - Northern Midlands Solar Farm

Existing Features
- Parcels
- Existing Roads
- Conservation Covenant and Greening Australia Reserves
- Dams
- Watercourse
- Palmerston Substation
- Exsting Transmission Line

Proposed Development
- Connorville Station
- Access Roads
- Solar Farm
- Main Infrastructure Area
- Battery Energy Storage System
- Operations and Maintainence
- Swtichyard
- Construction Laydown / Car Parking Area
- 220 kV Transmission Corridor
- 33 kV Internal Tranmission Line
- Fence
- Main Access Points
- Secondary/Emergency Access Points

Version: 5

Date: 21/04/2023

0 250 500 m

1:25,000 at A1

cogency

ROBERT LUXMOORE
Project Management

Masterplan Page 3 Transmission Line - Palmerston Substation

2210 - Northern Midlands Solar Farm

Existing Features

- Parcels
- Existing Roads
- Dams
- Watercourse
- Palmerston Substation
- Exsting Transmission Line

Proposed Development

- 220 kV Transmission Corridor

Version: 5

Date: 21/04/2023

0 50 100 m

1:5,000 at A1

Solar West

Connorville Station Boundary

Fence

Solar Farm

Access Road (4m)

Construction Laydown / Car Parking Areas

Battery Energy Storage System

Operations and Maintainence

Switchyard

Main Infrastructure Area

220 kV Transmission Corridor

Existing 110 kV Transmission Line

Construction Laydown / Car Parking Area

33 kV Internal Transmission Line

cogency

Robert Luxmoore Project Management

Masterplan Page 4
West Area

2210 - Northern Midlands Solar Farm

Existing Features

- Parcels
- Existing Roads
- Conservation Covenant and Greening Australia Reserves
- Dams
- Watercourse
- 110 kV Exsting Transmission Line

Proposed Development

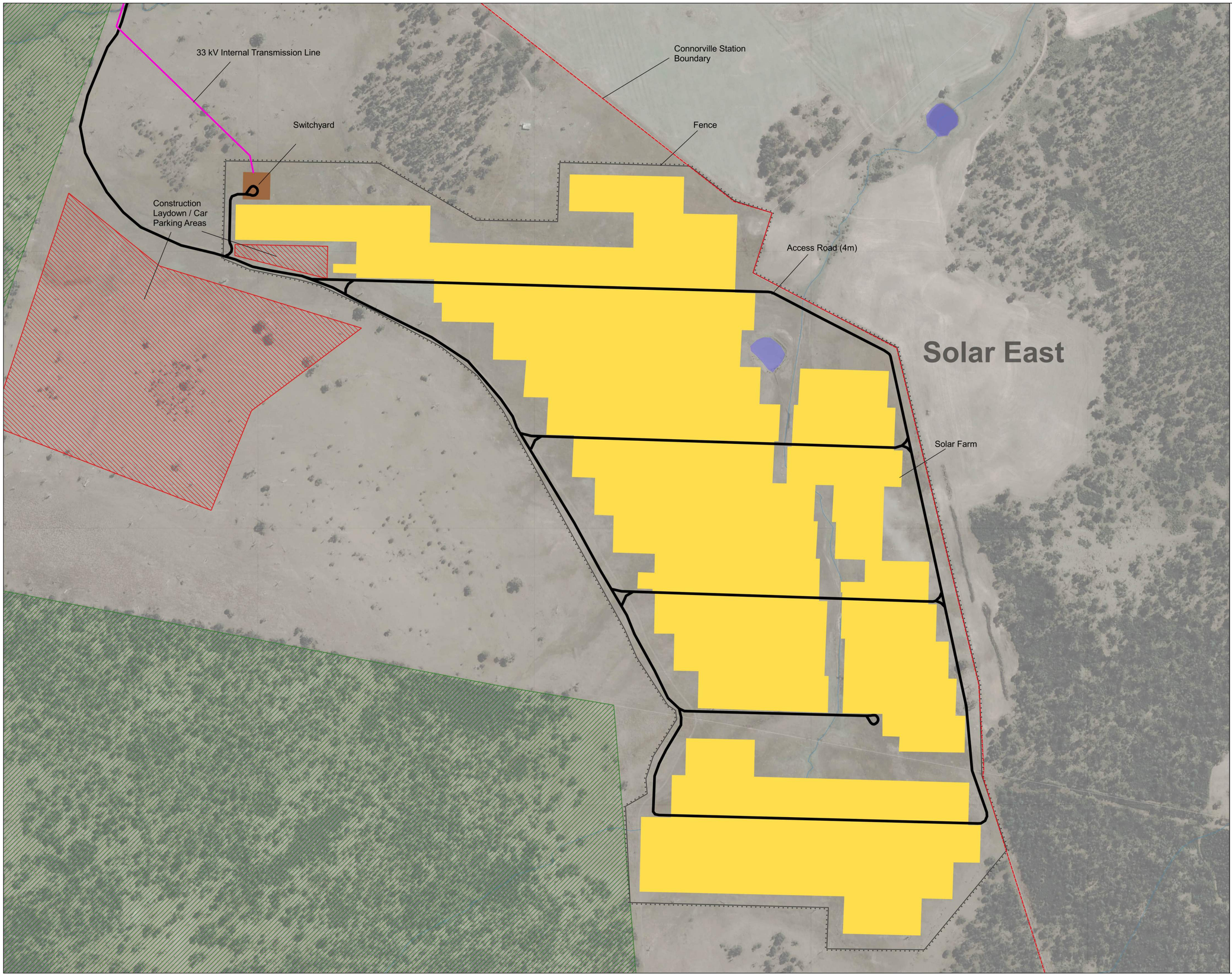
- Connorville Station
- Access Roads
- Solar Farm
- Main Infrastructure Area
- Battery Energy Storage System
- Operations and Maintainence
- Swtichyard
- Construction Laydown / Car Parking Area
- 220 kV Transmission Corridor
- 33 kV Internal Tranmission Line
- Fence
- Main Access Points
- Secondary/Emergency Access Points

Version: 5

Date: 21/04/2023

0 100 200 m

1:7,000 at A1



cogency

ROBERT LUXMOORE Project Management

Masterplan Page 5 East Area

2210 - Northern Midlands Solar Farm

Existing Features
- Parcels
- Existing Roads
- Conservation Covenant and Greening Australia Reserves
- Dams
- Watercourse

Proposed Development
- Connorville Station
- Access Roads
- Solar Farm
- Swtichyard
- 33 kV Internal Tranmission Line
- Construction Laydown / Car Parking Area
- Fence
- Main Access Points
- Secondary/Emergency Access Points

Version: 5

Date: 21/04/2023

0 50 100 m

1:3,000 at A1

pitt&sherry

Northern Midlands Solar Farm – Traffic Impact Assessment

Pitt & Sherry (Operations) Pty Ltd
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AGRICULTURAL ASSESSMENT

CONSTRUCTION AND OPERATION

of the proposed

NORTHERN MIDLANDS SOLAR FARM (NMSF)

Prepared by

J.E. Voorzaat
B.Ag

15th May, 2023

Table of Contents

1. Introduction

1.1 Project Brief

Ag-Challenge Consulting has been instructed by Robert Luxmoore Pty Ltd, project management consultants, on behalf of client Connorville Estates Pty Ltd, to investigate the agricultural impacts of a proposed solar farm, transmission line, and battery storage complex on farming land within *Connorville Station* near Cressy in the Northern Midlands of Tasmania. The entire proposed development impacts ~543 ha of grazing and open woodland, and the proposed solar array area covers ~432 ha.

The site has existing 110 kV voltage transmission lines traversing the property, however due to scale of the proposed development, a new 220 kV line is proposed to be instated adjacent to the existing transmission line for the export of renewable energy. Site investigations are ongoing and detailed plans are being developed with respect to all physical and cultural considerations and following engagement with communities and authorities.

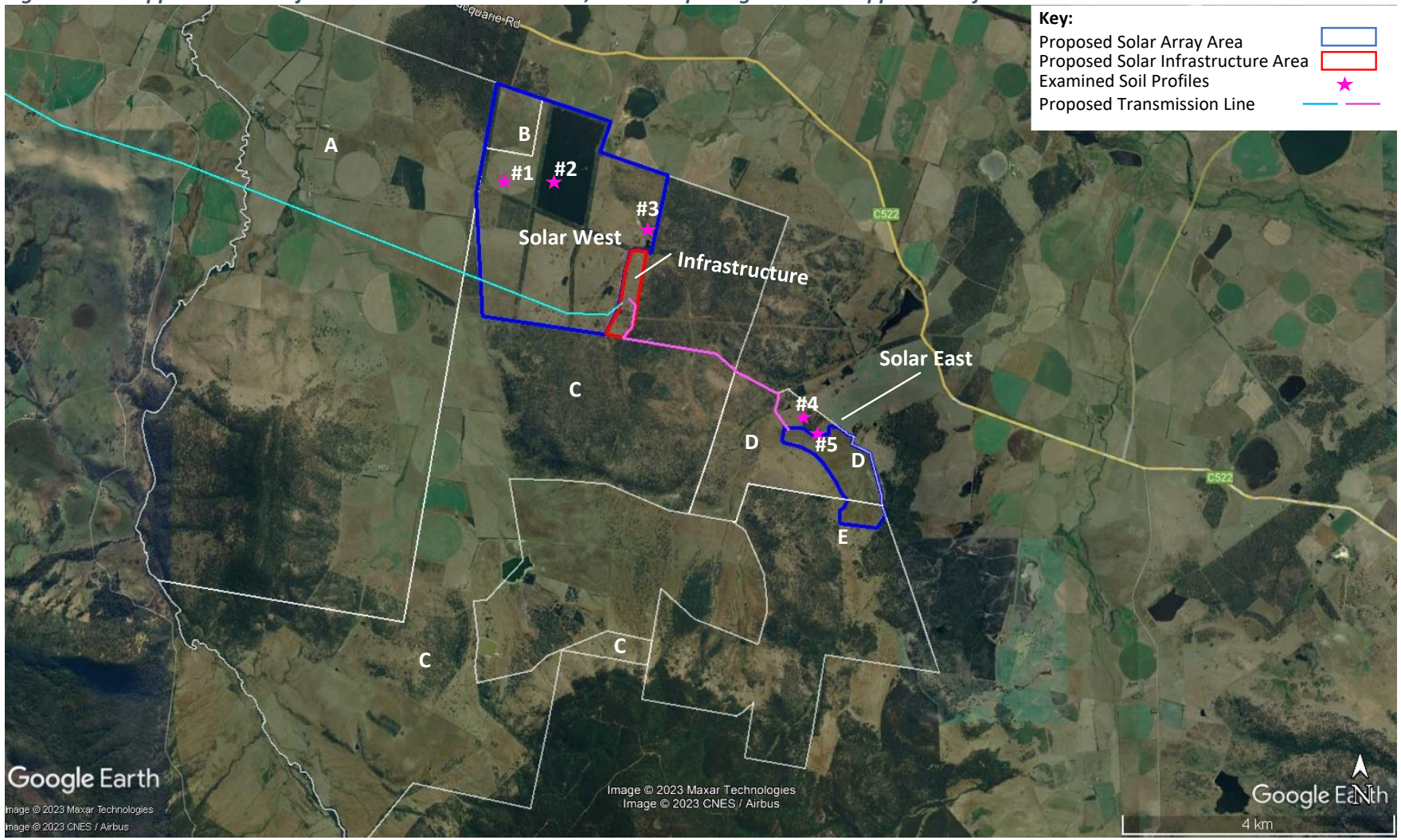
This investigation describes the existing agricultural use in both a local and regional context. The investigation is to consider the impact of the solar development as well as the proposed transmission lines on the existing uses of the land, identify any potential impacts on adjacent properties and determine whether the proposal is likely to have any adverse impacts on surrounding land uses and the regional agricultural economy.

The proposed development area includes the outlined Solar West, Solar East, transmission lines, and battery and infrastructure areas of Figure 1. The combined development area is hereinafter referred to as the Subject Site or site, and the separate land titles of the Subject Site are located within are listed in Table 1.

Table 1. Title specifications of Subject Site. N.B. Other titles within Connorville Station not relevant to the Subject Site are not included.

Property Designation on Figure 1	Property ID	Title Reference	Total Approx. Title Area (ha)	Development Zone Pertaining to Title
A	6751470	133307/1	3,332	Transmission Line
B	6751470		67	Solar West (~440 ha)
C	6751489	132520/1	3,267	
D	2680118	145787/1	340	Solar East (~103 ha)
E	2680134	145788/1	896	

Figure 1. The Approximate Subject Site – titles outlined white, letters depicting titles. See Appendix IV for details.



1.2 Experience and Capability of Ag-Challenge Consulting

Ag-Challenge Consulting is an agricultural consultancy company servicing the dairy, beef, and potato industries as well as other high rainfall and irrigated agriculture industries of Southern and Northern Victoria. The company is based at Warragul and the principals of the company have been providing independent farm consultancy advice since 1988 from this location. There are five active consultants within the company that service approximately 200 individual farmer clients with consultancy services from Ag-Challenge Consulting, as well as industry associations, financial institutions, and government. The company is active in vocational training, running focus farms and discussion groups and undertaking farm design work. The recycled water industry is a significant user of Ag-Challenge Consulting for the design and monitoring of recycled water projects. The renewable energy industry has collectively been a significant client of Ag-Challenge Consulting, using the company services for site selection and design, liaison with adjacent farm businesses and assistance in satisfying the provisions of planning schemes, including the development of Agricultural Impact Assessments for planning applications.

2. Regional Context

2.1 Planning Provisions

The Subject Site is all within the Agricultural Zone of the 2022 Northern Midlands Planning Scheme. The purposes of the Agricultural Zone are *to protect land for the use or development of agricultural use by minimising*:

- *Conflict with or interference from non-agricultural uses*
- *Non-agricultural use or development that precludes the return of the land to agricultural use*
- *Use of land for non-agricultural use in irrigation districts.*

A planning permit is required for the development and use of utilities (including renewable energy facilities) within the Agricultural Zone, and the Planning Scheme states that a condition of approval is that the facility must meet the use performance criteria of the Planning Scheme. Among other provisions, Clause 21.0 states that the applicant must demonstrate that the development of renewable energy facilities be consistent with the local area planning objectives, particularly within declared irrigation districts. This Agricultural Assessment forms part of the response to the provisions of Clause 21.0

Parts of the site are subject to a number of planning overlays. A Bushfire Prone Area overlay pertains to the whole area and means to ensure any use or development will be designed and managed as to reduce fire risk to human life and property. Select tracts of bushland within the Subject Site fall under the Priority Habitat Overlay which prioritises the protection of areas of vegetation identified as having conservation value. Other overlays including the Land Slip Hazard and Flood Risk Areas impact the greater land titles that the Subject Site are part of, however are not directly located within the Subject Site itself.

2.1.1 Guidelines for Renewable Energy Facilities

Within Tasmania, the growth of renewable energy facilities has traditionally been in hydro power with some recent development of wind farms. Large-scale solar farms are a relatively new form of power generation and land use in Tasmania. The author is not aware of any specific guidelines for site selection and site development for solar farms within Tasmania, particularly for assessing the impacts on agriculture. As such, the Victorian Government guidelines have been adopted as a default.

In the state of Victoria, there has been a rapid increase in the development of renewable energy facilities using solar arrays on agricultural land. The Victorian Government has responded to this increase by preparing and publishing a set of guidelines for proponents to consider and prepare an appropriate response. Those *Solar Energy Facilities Design and Development Guidelines (October 2022)* specify factors that need to be considered during the site selection and decision-making process in order that agricultural production is not unduly detrimentally affected. These factors include:

- *Protecting strategically important agricultural and primary production land from incompatible land use.*
- *Protecting productive agricultural land that is of strategic significance to a local area or in a regional context.*
- *Avoiding the loss of productive agricultural land without considering the impact of the loss on the agricultural sector and its consequential effect on other sectors.*

The agricultural values of the land will be assessed in accordance with the Victorian guidelines, including an assessment of the agricultural significance of the land and the location of agriculturally significant land within the shire and the region. A summary of this assessment may be found in Table 5.

2.2 Climate

Connorville Station has its own rainfall recording station (BOM station no. 91019) that has been operational since 1924 and the average long-term monthly and annual rainfall are presented in Table 2. Despite a temperate climate, the Northern Midlands is the driest agricultural region in Tasmania,[1] and the Subject Site has a moderate average annual rainfall of 610 mm.

Table 2. Monthly average rainfall (mm) for Connorville Station (Station No. 91019).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Connorville	38	39	40	49	49	54	66	67	58	53	47	49	610

The rainfall data for this Bureau of Meteorology (BOM) station has been entered into a water budget spreadsheet that can be used to predict seasonal surpluses and deficits (Appendix II). Allowing for an 80 mm carry forward of soil moisture from the wetter months into the drier period of the year, and a pasture crop factor ranging from 0.6 in mid-winter through to 1.0 in

[1] State of Victoria (Department of Education and Training). *Grasslands - Tasmanian Northern Midlands.* https://grasslands.ecolinc.vic.edu.au/bioregions/tasmanian-northern-midlands.

summer, the growing season for pasture is predicted to be for about 7.5 months each year, with soil moisture being a significant restriction to growth in December, January, February and March.

The BOM meteorology station at Cressy Research Station (station no. 091306) records daily maximum and minimum temperatures as well as humidity and wind speed. This meteorology station is ~10 km from Connorville Station and representative of the general climate in this part of the Northern Midlands. A summary of the temperature data is provided in Appendix III. *The Midlands has both the warmest summers and some of the coldest winters in Tasmania.*[1] Frost is likely to have occurred if the screen temperature at the meteorology station falls to 2°C or less and a severe frost is likely to have occurred if screen temperature drops to 0°C or less. Frost will restrict the growth of pasture and crops, increase risk of livestock mortality (especially in young or susceptible stock), and out of season frosts have the potential to damage pastures and crops at sensitive growth stages. The data in Appendix III identifies severe frost occurrence can occur at any point throughout the year and at least one frost can be expected annually in all months except for January and February. Frost occurrence peaks in June/July (16 frosts per month), decreasing in the months either side until two frosts are expected annually in the months of March and December. Importantly severe frosts do occur throughout Winter, Spring, and the later months of Autumn, and occasionally in the Summer months (1 year in 10).

2.3 Regional Land Form

The Subject Site is located on the fringe of the Great Western Tiers foothills and within the broad expanse of the Launceston Tertiary Basin. Much of the undulating land (ranging from almost flat to ~8% slope) of the area has parent material consisting of dolerite and basalt lava flows providing clays and gravels, and dolerite rock outcrops are common on hillsides and ridges. On hills where dolerite outcrops are present, slumping and minor landslips are often observed. The Launceston Basin is a closed graben generally sloping with a local average relief of ~2-3% to the northwest, and the land system consists of Tertiary lacustrine clays, sands and gravels distributed by streams and rivers creating gentle landforms, terraces and flood plains.[2] There are several rivers that flow through the Launceston Basin, including the South Esk, Maquarie, Elizabeth, Nile, and Lake Rivers. Lake River is the closest waterbody of significance to the Subject Site (~3.2 km away) and abuts the western border of Connorville Station.

2.4 Regional Land Use

Land use within the larger Launceston Basin is predominately agricultural. Grazing of sheep for wool and prime lamb production and cattle on improved pastures are the main enterprises in the region. Less intensive fattening of livestock grazing on native pastures are practiced where climatic conditions pair with undulating stony country, or sandy, shallow soil profiles that limit pasture growth. Silviculture and agroforestry are also practiced on these areas to increase land utility. Forage cropping and dryland grain, oilseed and consumption grade legume cropping are also a common occurrence throughout the region.

[2] Grose, C & Moreton, R. (1996). *South Esk Report.* Department of Primary Industry and Fisheries Prospect Offices.

Due to the reliable supply of river water coming off the Great Western Tiers and surrounds, the Cressy-Longford Irrigation district has been established with over 150 km of channels within the Launceston Basin, however these channels do not service the Subject Site. Irrigation supports more intensive cash cropping, fodder cropping, horticulture, dairying, and other intensive grazing operations.

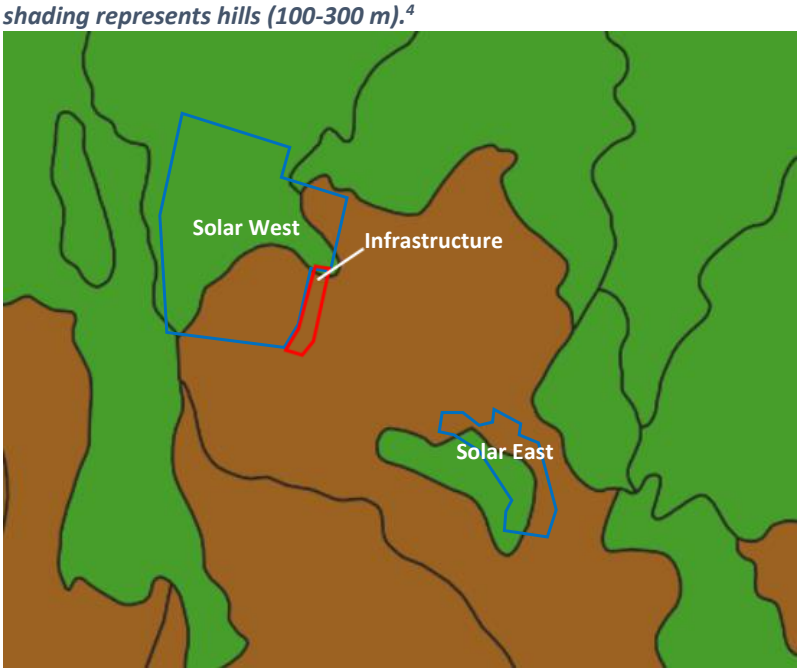
Additionally, within the Launceston Basin, urban sprawl has exerted on-going pressure on rural land for rural lifestyle blocks and small lot developments. This is particularly evident around the major towns of Launceston, Longford, Campbell Town, and Westbury.

3 Site Characteristics

3.1 Description of the Land

The Subject Site is located within the undulating plains of the Launceston Tertiary Basin and on the lower foothills of the Great Western Tiers (Figure 2). The closest waterbody of significant size is the Lake River, located ~3.2 km west of the Subject Site. The undulating plains of the basin are comprised of Tertiary clays, sands and gravels, deeply weathered and deposited to form dissected river terraces.[3] Within river terraces, aeolian processes have formed occasional overlying moderate to deep sand dunes overlying alluvial clays. The lower foothills of the Subject Site have rolling land with Jurassic dolerite surface rock and outcrops. Weathering of resistant dolerite and basalt lava flows and the deposition colluvium and alluvial fans have formed these hilly land systems.[3]

Figure 2. Land Systems of the Subject Site. Green shading denotes undulating plains and brown shading represents hills (100-300 m).[4]

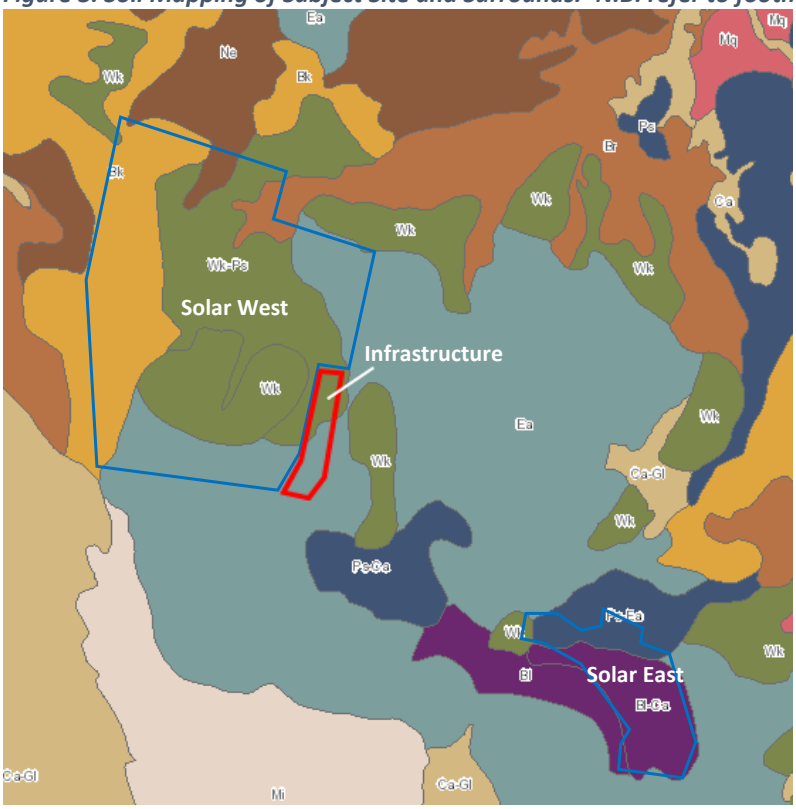


[3] Grose, C & Moreton, R. (1996). *South Esk Report.* Department of Primary Industry and Fisheries Prospect Offices.

[4] Retrieved from https://maps.thelist.tas.gov.au/listmap/app/list/map.

The Subject Site is partially situated on the lower foothills of the Great Western Tiers, and dolerite surface rock and outcrops can be commonly seen on the land. The Solar East and West (Figure 1) are disconnected by a parcel of open woodland under a Conservation Covenant which exhibits rolling to steep hills with surface dolerite present. Solar West consists of flat plains in the northwest paddock, to gently undulating slopes (3-8% gradient) in the rest of the area. Within Solar West, surface rock is uncommon due to removal through farming, but likely to be present within the soil subsurface, especially where the land becomes steeper and more undulating. In Solar East, surface dolerite is more common with larger outcrops present. Further from the rolling foothills, Solar East becomes part of a low gradient drainage basin, where there are some poorly drained areas, particularly along the margins of several small streams and drainage lines that drain towards the northeast.

Figure 3. Soil Mapping of Subject Site and Surrounds.[5] N.B. refer to footnote for soil key.[6]



3.2 Soils

There are a variety of soils formed within the undulating river terrace and foothill land systems. The soils of the area have been described and mapped by Doyle in 1993 (Figure 3). Soils of the proposed Solar West and Solar East sites were assessed by Jayden Voorzaat of Ag-Challenge Consulting during the site visit on October 22, 2022. Five soil profiles were assessed to affirm the accuracy of soil mapping by Doyle (1993), and full soil profile descriptions can be found in Appendix I.

[5] Retrieved from https://maps.thelist.tas.gov.au/listmap/app/list/map.
[6] Doyle, RB. (1993). *Reconnaissance Soil Map of the South Esk Sheet, Tasmania (southern half).* Department of Primary Industry and Fisheries, Tasmania, Australia.

On the proposed Solar West, Grose and Moreton have described the parent material of soils as Launceston Tertiary Basin sediments on river terraces, except for areas closer to the lower foothills, of which the soils have formed on Jurassic dolerite. Soils observed on Solar West all had sand fractions in the A1 horizons, varied in texture from sand to clay loam in the A2 horizons, and all overlie medium to heavy clay B horizons. Part of the undulating hill that the existing pine plantation lies on is likely an aeolian wind-blown sand dune overlying alluvial clays. All soils observed were texture contrast, and greyer chromas with poor subsoil structure, indicating imperfect drainage on all soil types expect for Eastfield Association soils (Soil Profile 3).

Due to severe weather conditions at the time of the site visit, soil profiles could only be examined in the north western area of the proposed Solar East. On the undulating hills characterised as Eastfield Association (Soil Profile 4), texture contrast soils with loamy to sandy loam A horizons abruptly transition to heavy clay subsoils. Grey soil horizons and poor structure indicate imperfect drainage. Large dolerite surface stones were observed in the immediate area with a stone outcrop close by. In the drainage lines of Solar East are Canola Association soils (Soil Profile 5). These were the only gradational soils observed on the property and the weak structure and grey colours indicates poor drainage. On the remainder of Solar East, it is assumed similar soils are found as well as Blessington and Panshanger Association soils that both have significant sand fractions as well as clay components.[7] While Blessington soils are described as imperfectly drained, Panshanger soils may be the only rapidly drained soils on the property.

3.3 Vegetation

Pastures occur across most of the Subject Site. The pastures in most instances consist of a mix of native grasses, clover, and introduced species, and would generally be regarded as unimproved. In more productive areas including land under centre pivot irrigation in the northwest of Solar West (Section 3.4), and on the gentle plains, ryegrass, cocksfoot and clover have been sown for grazing purposes. The ~40 ha pivot irrigation area of the Solar West northwest paddock has been sown to ryegrass and clover. Other species recorded within the pastures were capeweed, flatweed, chickweed, some gorse, and spiny rush within low lying areas. Within the grazing land and along laneways were plantations and sporadic placings of indigenous trees and shrubbery. Within the north central paddock of the Solar West site was a ~110 ha mature commercial plantation of pine. The pine plantation was scheduled to be harvested in the weeks following the site visit.

Remnant vegetation on the property include sporadically placed clusters of mostly black peppermint *(Eucalyptus amygdalina)* with some white gum *(Eucalyptus viminalis).*

Within the whole of Connorville Station, and between the two proposed solar sites are large tracts of land under Conservation Covenants. These areas host open woodland native forests that allow connectivity between areas of bushland.

[7] Grose, C & Moreton, R. (1996). *South Esk Report.* Department of Primary Industry and Fisheries Prospect Offices.

3.4 Water Supply

Stock water is available from farm creeks and dams for stock access. There are three large dams on the Solar West site, and two dams located on Solar East. Where dams are not present in a paddock for livestock access, freshwater is pumped from various farm dams and creeks via a stock water reticulation system to stock troughs. Stock water for the reticulation system is sourced from Lake River via two electric 3-phase pumps and reticulated through a mainline. From the mains, stock water can be diverted to several stock water troughs placed in paddocks.

The owner of Connorville Station holds an irrigation license from Lake River. From Lake River, two electric 3-phase pumps and a mains provides the reticulation infrastructure to service a number of centre pivots located across the station. Within the Subject Site there is a single centre pivot irrigator of ~40 ha located in Solar West that is used to grow irrigated pastures. It has been indicated by the farm manager that the centre pivot irrigation infrastructure can be easily relocated to other sites on the property to continue irrigating pastures.

3.5 Farm Infrastructure

The Subject Site has a network of all weather access tracks that permit movement around the property in most weather conditions. In extremely wet periods, some of the creek crossings become impassable due to flood flows over fords and culverts. There are several sets of stockyards and shearing facilities located throughout the 17,600 ha Connorville Station that are suitable for both sheep and cattle. An additional set of portable stockyards are also available for animal handling. Throughout Connorville Station, there are a number of sheds, buildings and homesteads to house workers, farm equipment and machinery. An existing transmission line traverses east to west across Connorville Station that also provides power to various houses and sheds. Multiple centre pivots (~13 in total) are scattered throughout different paddocks of Connorville Station and are used to produce irrigated pastures and forage crops.

Within the Subject Site, farm infrastructure includes all weather access roads and good internal fencing. Along the western boundary of Solar West is an open walled hayshed (~35m x ~6 m), and servicing the northwest paddock is a centre pivot of ~40 ha which may be relocated to another area of Connorville Station. Within the Infrastructure Area of the Subject Site, is a segment of the existing transmission line that traverses Connorville Station.

3.6 Current Land Use

The current land use is a combination of grazing with sheep, grazing with cattle, occasional irrigated fodder crop production, and farm forestry. Grazing occurs on both irrigated and dryland pastures. At the time of field inspection, ~40 ha of the Subject Site was irrigated pastures, ~110 ha of the site was commercial farm forestry, ~125 ha is fenced off and planted out to open woodland for wildlife corridors and windbreaks, and the remaining ~300 ha was available for dryland livestock grazing. The current grazing pressure are around 2000 crossbred ewes and 100 angus cows with calves at foot, which are grazed on ~275 ha. This

equates to a carrying capacity of 7 DSE[8]/ha. This figure of carrying capacity is a representative year-round stocking rate, as livestock will be removed from the Subject Site for extended periods at a time. Stock handling and shearing facilities are available in other areas of Connorville Station to service the livestock.

4 Land Capability and Agricultural Production Potential Assessment

4.1 Agricultural Land Capability Classification

Land Capability Rating Systems for agricultural land uses of broad scale grazing and cropping were developed by Grose and Moreton and mapped across the South Esk area in 1996, including the Subject Site.[9] This land capability system determines *"the ability of the land to sustain a range of land uses without degradation of the land resource. [It is] based on the physical limitations and hazards of the land, potential cropping and pastoral productivity, and the versatility of the land to produce a range of agricultural goods"* (Grose & Moreton, 1996).

More specifically, the Land Capability Assessment by Grose and Moreton (1996) considers inherent features of the land including geology, soils and slope, and other factors including climate, land degradation issues and land management requirements. Additionally, agricultural limitations including potential salinity, stoniness, drainage, and flooding are considered in these ratings. The classification system ranges from a rating of one through seven and is hierarchal in which Class 1 land is considered the best land and is highly versatile for a range of agricultural uses, and as the Class unit increases, more inherent limitations are considered to decrease the agricultural versatility of the land. Classes 1 to 4 are considered suitable for cropping activities, Classes 5 to 6 should be limited to pastoral grazing, and Class 7 is considered unsuitable for agricultural uses due to major limitations and required land management practices. The land capability ratings for grazing and cropping are provided in Figure 4, and ratings range from 4 to 5+6 across the landscape of the Subject Site.

Land Capability 4 is the dominant land capability rating for the Subject Site, and considered the least restrictive agricultural land on the property. Soil structural problems, frequency to inundation, and duplex characteristics of the soil with abrupt texture increases among other issues cause severe limitations to sustainability and increase susceptibility to erosion and land degradation. While this land has capability for intensive grazing, cropping rotations should be no more than two years in ten, and there are very high risks of crop failure – as observed at Soil Profile 3 (Appendix I).

Class 5 land covers a significant expanse of the Subject Site. Cropping is considered unsuitable in these areas and there are slight to moderate limitations on grazing use. Soil conservation practices are essential when farming these areas. A significant restriction of Class 5 land on dolerite (i.e. the Subject Site) is the presence of dolerite rock outcrops and stones. These severely limit management and cultivation potential among the other limiting factors stated for Class 4 land.

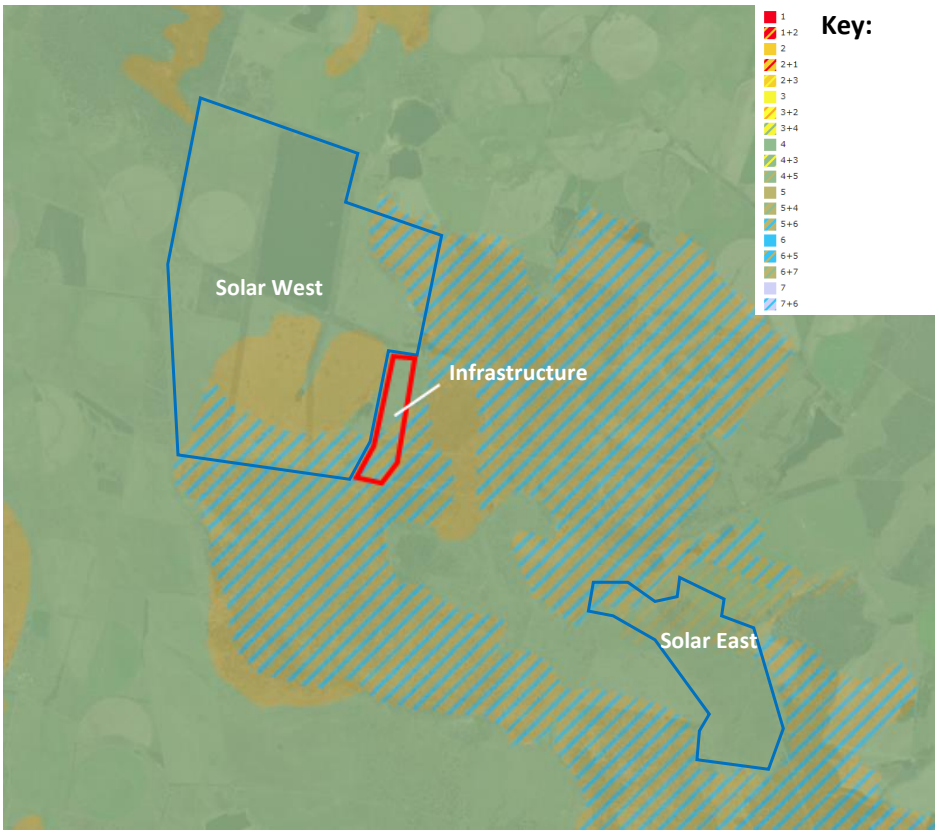
Class 6 land covers a minor but noteworthy portion of the Subject Site. This land is considered only marginally suitable for livestock grazing due to severe limitations. Excessive stoniness,

[8] DSE or dry sheep equivalent is a measure of carrying capacity and is defined as the amount of fodder required to maintain the liveweight of a 50 kg wether. 1 DSE = 8.3 MJ ME.

[9] Grose, C & Moreton, R. (1996). South Esk Report – Land Capability Survey of Tasmania. Department of Primary Industry and Fisheries Prospect Offices.

increasing slopes, and limiting factors indicated by Class 4 and 5 land means the land has high risks of erosion, low natural fertility, and highly restricted management access so that the land is restricted to light grazing practices.

Figure 4. Land Capability Ratings as mapped by Grose and Moreton.[10]



4.2 Land Quality & Strategically Important Agricultural Land

Agricultural land may be considered high value and strategically important due to a combination of features such as high quality or niche soils, good rainfall, access to irrigation, resilience to climate change, existing infrastructure investment and/or its special role within a specific industry.

The agricultural attributes of land that identify whether a particular parcel may be strategically important land or strategically significant are presented in Table 5, together with an assessment of how the subject land performs with respect to these attributes. The combined parcel of land can be described as fair quality land for grazing and fair to low quality land for broad acre cropping. The land of most value is the ~40 ha of centre pivot irrigation area. However it is not considered prime agricultural land due to the imperfect drainage of the texture contrast soils, the potential stoniness of dolerite rock in the area limiting cultivation, and high risk of frost throughout the year. The irrigated area has historically been used to grow pastures rather than crops, and it has been indicated by the farm manager that the irrigation infrastructure can be relocated with relative ease to other equally or more

[10] Grose, C & Moreton, R. (1996). South Esk Report – Land Capability Survey of Tasmania. Department of Primary Industry and Fisheries Prospect Offices.

productive areas at Connorville Station. Other than labour and some infrastructure costs, there are negligible impacts of moving irrigation infrastructure. Irrigation of native pastures or conversion to introduced pastures/crops on other areas of Connorville Station will likely increase agricultural productivity of the farm. For the balance of the Subject Site, the soils are not high quality or niche soils, the rainfall is moderate and variable with a pronounced dry season each year, there is significant annual frost risk, and there is no specific farm or public infrastructure which makes the land inherently productive or special from an agricultural perspective. The combined parcel of land is not prime agricultural land, in that it is not unique, not highly productive, not highly versatile for a multiple range of uses, and the available irrigated land has underlying soil and environmental constraints.

The combined parcel of land is productive farmland. The proposed change of primary land use to solar energy production will mean that the current agricultural versatility (cropping or grazing) will be reduced in favour of the alternative primary use for energy production. The design of the solar farm will however enable sheep to be grazed underneath the solar panels, thus retaining some of the current level of agricultural productivity. Underneath the solar array, solar panels will limit pasture access to sunlight and water, reducing pasture productivity. Positively, solar panels will benefit welfare of sheep, where shelter provided will help combat impacts of cold, frost, rain and harsh heat on sheep and lambs. Agricultural versatility and productivity will be reduced, however positive aspects of solar panels on animal welfare partly mitigate this reduction, particularly on the Subject Site where frost is a high risk.

The proposed transmission line and various options running from the Infrastructure Area will have negligible impact on livestock grazing practices.

Table 5. Assessment of the agricultural values of the Combined parcel land.

Attribute groups adapted from Solar Energy Facilities – Design and Development Guideline (2022).

Attribute Group	Assessment Criteria	Assessment	Comments
Soils and Landscape	Inherent Soil Quality Niche Soil Inherent Soil Versatility	Fair quality soils No Moderate versatility	These soils are generally imperfectly drained, have low natural fertility and have fair water holding capacity. They are not highly productive and have some management constraints with weak to apedal surface horizons and poor aggregate stability.
Water and Climate	Access to modern irrigation infrastructure	Low	Subject Site has low irrigation investment, which may be shifted to other areas of the Station to minimise infrastructure loss and shift production elsewhere. 93% of the Subject Land is entirely dependent on natural rainfall. Annual rainfall of the area is 610 mm which is adequate to support a growing season of around 7-8 months.
Impact of fragmentation	Impact on local and regional productivity	Low	The impact on local and regional productivity is estimated to be a loss of around 0.2% of sheep production and negligible loss of cropping production. Loss of productivity is mitigated if sheep are grazed beneath solar panels.
Impact of change of land use	Recent reform to update and modernize production or create industry clusters	No	No recent changes to these properties or within the general area.
Specific planning protection for agricultural values	Land set aside or defined for agricultural use and development in a planning scheme or other strategic document	No	The land has no special protection for agricultural values outside of the Agricultural Zone planning provision of the Northern Midlands Planning Scheme. The proposal minimises impacts on the agricultural values of the land by implementing Agrisolar.[11]
Government Investment	Government investment to support productivity from the site or the area	No	There is no specific government investment relevant to the agricultural use of this property or this area.
Co-location of solar energy facility with agriculture	Opportunity to co-locate the solar energy facility with agricultural production to diversify farm income without reducing productivity	Yes	The solar farm design will enable the grazing of sheep under the panels, thus mitigating some of the potential loss of agricultural production.

5. Environmental Risks

5.1 Fuel Load and Fire Risk

Fire risk management will be the subject of a separate investigation.[12] However, management of the fuel load from pasture growth beneath the panels requires some mention within an agricultural context. Much of the incident rainfall at the Subject Site will be directed by the panels to the soil surface directly below the panel rim. The soil surface beneath the panels

[11] Agrisolar is the cohabitation of solar farms and agricultural enterprises.

[12] Refer to the Bushfire Impact Statement by Ground Proof Mapping P/L.

will need to be protected from this concentrated rainfall impact, and the growth of the protective ground cover will need to be controlled with planned management. If unmanaged, the growth could become a fire hazard.

It is proposed that the growth will be partially controlled by grazing sheep under the panels and slashing as necessary or if required. The grazing will have the primary purpose of managing fuel load to a defined maximum for the duration of the fire risk period, while at the same time also maintaining a soil cover in excess of 70% to protect the soil surface from rainfall impact during storm events. These objectives will take precedent over any secondary objectives to optimise liveweight gain in ewes and lambs. The farming objectives can be quite different from the decisions for fire risk mitigation. The solar arrays will be arranged into fenced paddocks that will enable controlled grazing to manage the fire risk, and the paddock shapes and alignments will be arranged so that under panel mustering can be achieved efficiently. Some mechanical vegetation management (i.e. slashing) will be required to compliment grazing for vegetation management.

5.2 Weeds

The main recorded weed species of significance within the Subject Site was Gorse *(Ulex europaeus).* While Gorse was present on the property, populations were sporadic and confined to laneways, drainage lines, and fenced wildlife corridors. The Northern Midlands is a Zone B municipality for the management of Gorse and the main objective is containment rather than eradication. While a weed of significance, populations are few at the Subject Site and Gorse is currently of low concern. A weed management plan will be prepared as part of the Project design. The weed management plan will aim to suppress the growth of weeds and ensure that any *declared weeds* by the Tasmanian Government of concern are suppressed as far as practical.

5.3 Soil Erosion

The design and management of surface runoff for the Subject Site requires special consideration. There is only minor evidence of degradation across the Subject Site, but these soils are potentially susceptible to erosion. In certain areas, the A2 horizon of these soils have virtually no structure, and if the soil surface is disturbed or removed, the A2 horizon would be susceptible to rilling and sheet erosion. Once an erosion head is established it can be difficult to contain. The development of the Subject Site for solar energy facility will involve substantial changes to the local hydrology, and special consideration of the risks of soil erosion are required.[13] While erosion remains a risk, it should be noted that the Land Slip Hazard overlay does not pertain to the Subject Site.

In the first instance, water runoff from the panels may result in impact damage and dispersion of the soil below the panels where the water falls. The panel will tend to concentrate runoff as both an impact and an increased flow into a relatively small area. The degree of concentration will depend on the size of the panels, with smaller panels providing a lower level of risk than larger panels. It will be necessary to maintain permanent pasture cover of at least 70% of the ground surface to absorb the impact energy of the rain splash.

[13] Special consideration to take form of a separate Hydrology Report and is included in the Traffic Impact Assessment by Pitt & Sherry.

With impact damage minimized, it will also be prudent to introduce measures that will retard surface runoff and increase infiltration. The total area of panels is substantial and the runoff from storm events will be concentrated well beyond the concentration of runoff from pasture. The surface runoff within and across the Subject site needs to be dispersed and retarded as far as is practically possible around the property, so that no higher storm runoff occurs within any natural or manmade waterway. These soils will be prone to rilling and gullying along drainage lines where concentrated flows occur during storm events. The retardation of the surface runoff along stable, slow moving drainage channels will be a key requirement of Project design.

6. Agricultural Impacts of the Proposal

6.1 Impact of Solar Farm on Neighbouring Farms.

The Subject Site (~543 ha) is part of a large sheep and cattle station of ~17,600 ha. While sheep would remain able to graze beneath solar panels, this represents only ~3.1% of the Station area (including areas under Conservation Covenants). The Subject Site would have a negligibly reduced agricultural value. This is a low impact on the property's agricultural amenity. Additionally, the proposed solar array area is disconnected from any public roads and abuts private land.

The proposed overhead transmission line that will connect the solar energy farm to the electricity grid have the potential to impact irrigation infrastructure and the ability to efficiently manage irrigated crops. High pressure travelling irrigation guns are usually precluded from operating beneath overhead transmission cables. Siting of the towers for the transmission lines may impede the path of a centre pivot irrigator or a lateral move irrigator. Some centre pivot irrigators use end guns to apply water to the corners of a paddock and these may need to be disabled if they are estimated to be in spraying range to an overhead transmission line. The location of the overhead line may affect the safe operation of aircraft for spraying, including the ability to bank and turn at the end of each pass. Some agricultural harvesting machinery may be at or in excess of the height tolerance for machinery to be able to pass safely beneath overhead power lines. The proposed route for the overhead transmission line shown on Figure 1 does not indicate any specific problems with the placement of towers or the alignment which will impact on the ability to efficiently manage irrigated crops in close proximity to the proposed alignment.

There are a number of sheep and cattle grazing and cropping properties that adjoin Connorville Station along the north, east and western boundaries. Most neighbouring properties undertake some form of irrigation – predominately centre pivot – which is used to irrigate pastures and crops, including canola. There are other Conservation Covenants in the immediate vicinity and smaller commercial plantations.

South and southwest of Connorville Station is a large expanse of native forests for production as well as for protected reserves and bushland. There is no agricultural use in this area.

There is no perceived detrimental impact on the continued agricultural use of surrounding properties for grazing, cropping and irrigation as a consequence of the development of the Subject Site for a solar energy facility.

6.2 The Agricultural Amenity of the Region.

The Australian Bureau of Statistics (ABS) collects and publishes data for agriculture and agricultural production at Statistical Area Level 4 (SA4). SA4 are geographical areas with defined boundaries and broadly similar production systems. The SA4 regions are the largest sub-State regions in the Main Structure of the Australian Statistical Geography Standard and have been designed for the output of a variety of regional data. They are generally representative of regional labour markets, but also tend to represent agricultural groupings as well. The Northern Midlands sits within the SA4 Launceston and North East region which includes the shires of Meander Valley, West Tamar, George Town, Launceston, Break O'Day, Dorset and Flinders and forms a geographical bundle of land in the north-eastern part of Tasmania.

The 2019-20 ABS data for the Launceston and North East region lists the following

Number of sheep	>983,000
Number of beef cattle	>159,000
Broadacre crops	53,450 ha

In the regional context the Subject Site comprises almost none of the broadacre crops in the region, where it is rare for the farm manager to put the land into a broadacre cropping phase. The Subject Site provides grazing for 0.20% of the regional sheep flock and less than 0.06% of the regional beef herd. Sheep grazing will continue with development of the solar energy facility with sheep grazing beneath the panels, but the cropping and beef cattle grazing will no longer be possible and will be discontinued.

The impact of agricultural amenity loss from the Subject Site on the region is very low and any loss is considered insignificant.

Carrying capacity of the Subject Site has been estimated to be around 6 DSE/ha. When developed, grazing of sheep under the panels will be part of the on-going management of the facility. Full design details are yet to be determined, but with appropriate watering points, paddock design and pasture management, it is reasonable to expect that the existing carrying capacity of 6 DSE/ha could be retained and possibly even improved.

7. Conclusions and Summary

- The Subject Site comprises approximately 543 hectares of agricultural land in the Northern Midlands of Tasmania. The land is currently utilised for grazing on both dryland and irrigated pastures.
- A summary assessment of the agricultural values of the Subject Site is presented in Figure 5.
- There are no inherently unique features about the Subject Site that distinguish it from neighbouring farms in the area.
- The climate of the area has a reasonably reliable and moderate average annual rainfall of 610 mm, cool to cold winters with a significant frost incidence from March to December, and a growing season of about 7-8 months.
- The landform is mostly a flat to gently undulating river terrace and partially lower foothills of the Great Western Tiers. Alluvium, and weathering of dolerite and basaltic lava flows have formed these landscapes.

- The soil types present are noted for their duplex profiles (contrasting texture between surface soils and subsoils), except for soils found in drainage lines which are gradational. The Subject Site soils mostly have imperfect internal drainage characterised by most profiles exhibiting poor structure and greyish soil colours. Most soils overly medium to heavy clay subsoils.
- The dominant agricultural use of the land is grazing with sheep and cattle on irrigated and dryland pastures. Farm forestry is also practiced on the property, and significant areas of land have been fenced off for revegetation.
- The land has a Land Capability Rating for agricultural use ranging from 4 to 6 on a scale of 1 to 7. This indicates serious limitations to agricultural usefulness and the land is limited to intensive to light grazing practices with high risks of crop failure. Significant land conservation measures are essential to sustainably manage agriculture on this land.
- The land is neither highly productive nor highly versatile. It is not considered to be significant land or strategically important land from an agricultural perspective.
- The development of a solar energy facility on the combined property will alter the nature of the farm. Cropping will no longer be practical. With appropriate design of the panels and improvement of stock water availability, sheep will be able to graze the land. Merging solar farming and sheep grazing will diversify income streams creating an Agrisolar enterprise.
- Excluding labour and some infrastructure costs, irrigation infrastructure within the Project Site may be salvaged and moved to other productive areas of Connorville Station. This is likely to increase net agricultural productivity of the whole farming operation.
- Wildfire risk occurs where attention is not given to how fuel loads are managed. Flexible fuel load management will be considered as part of the project design and separate Bushfire Report. Under panel grazing with sheep is proposed to be part of that management.
- There are no perceived detrimental impacts of the development of the solar energy facility to the surrounding farm businesses. The proposed route for the overhead transmission line does not indicate any specific issues for managing irrigated crops in close proximity to the proposed alignment. The impacts to the agricultural amenity of the Region are not significant.
- The concentration of runoff from the panels onto the soil surface may initiate soil erosion. Consideration needs to be given to minimizing this risk through careful project design which will be covered in the separate Hydrology Report.

Appendix I – Soil Profile Descriptions

Site 1: Solar West – Southern Area of Existing Centre Pivot.

Depth (cm)	Horizon	Description
0 – 10	A1	Very Dark Brown 7.5 YR 2.5/3 **Sandy Loam** Good structure *Clear transition to:*
10 – 25	A2	Brown 7.5 YR 4/4 **Clay Loam** Good structure Common grey and sporadic red mottling, common gravels (<1mm) *Abrupt transition to:*
25 – 48	B1	Light Brownish Gray 10 YR 6/2 **Medium Clay** Weak structure Yellowish brown mottling *Diffuse transition to:*
48 – 60	B2	Grey 10 YR 6/1 **Heavy Clay** Poor structure Poorly drained *Auger refusal at 60 cm. Possible bedrock or large stone.*

Gentle 2-3% slope, southwest facing, imperfect internal drainage, mixed irrigated pasture (ryegrass and clover dominant). Soil type consistent with the *Brickendon Association (Bk)* of Doyle (1993).[14] Soil on Launceston Tertiary Basin sediments – higher level river terrace.

[14] Doyle, RB. (1993). *Reconnaissance Soil Map of the South Esk Sheet, Tasmania (southern half).* Department of Primary Industry and Fisheries, Tasmania, Australia.

Site 2: Solar West – Southern Area of Existing Pine Plantation

Depth (cm)	Horizon	Description
0 – 18	A1	Very Dark Greyish Brown 10 YR 3/2 **Loamy Sand** Apedal *Abrupt transition to:*
18 – 45	A2	Light Brownish Grey 10 YR 6/2 **Sand** Very weak structure *Abrupt transition to:*
45+	B1	Brownish Yellow 10 YR 6/6 **Heavy Clay** Very poor structure Common red mottles and grey mottling beginning with few and increasing to common at depth *Termination at 100 cm. No auger refusal.*

3-4% relief, north aspect, poorly structured soil. Soil type consistent with the *Woodstock Association (Wk)* of Doyle (1993).[15] Soil on Launceston Tertiary Basin sediments – relict lakebed or river terrace.

[15] Doyle, RB. (1993). *Reconnaissance Soil Map of the South Esk Sheet, Tasmania (southern half).* Department of Primary Industry and Fisheries, Tasmania, Australia.

Site 3: Solar West – Southeast Paddock of Solar Farm West

Depth (cm)	Horizon	Description
0 – 18	A	Dark Brown 10 YR 3/3 **Loamy Sand** Apedal *Abrupt transition to:*
18 – 70	B	Yellowish Brown 10 YR 5/6 **Medium Clay** Moderate Structure *Diffuse transition to:*
70+	C	Yellow 10 YR 7/8 **Heavy Clay** Poor structure Partially weathered parent material *Termination at 90 cm. No auger refusal.*

5-6% slope, northeast aspect. The undulating paddock comprised of a failing forage crop with spiny rush present in drainage lines. Moderate drainage. Soil type has components of both *Woodstock Association (Wk) and Eastfield Association (Ea)* of Doyle (1993).[16] Soil on Launceston Tertiary Basin sediments – relict lakebed or river terrace, or Jurassic Dolerite colluvium.

[16] Doyle, RB. (1993). *Reconnaissance Soil Map of the South Esk Sheet, Tasmania (southern half).* Department of Primary Industry and Fisheries, Tasmania, Australia.

Site 4: Solar East – Undulating Land on Fringe of Native Vegetation Cluster

Depth (cm)	Horizon	Description
0 – 18	A1	Very Dark Brown 10 YR 2/2 **Loam** Good structure *Diffuse transition to:*
18 – 45	A2	Greyish Brown 10 YR 5/2 **Sandy Loam** Liquid at time of sampling, poor structure *Diffuse transition to:*
45+	B1	Dark Greyish Brown 10 YR 4/2 **Heavy Clay** Poor structure Very common quartz gravels (<1mm) *Termination at 100 cm. No auger refusal.*

6-8% slope, south aspect. Pasture consisting of native grasses and clover. Capeweed present. Large dolerite surface stones and stony outcrops in proximity. Soil type consistent with the *Eastfield Association (Ea)* of Doyle (1993).[17] Soil on Jurassic Dolerite colluvium.

[17] Doyle, RB. (1993). *Reconnaissance Soil Map of the South Esk Sheet, Tasmania (southern half).* Department of Primary Industry and Fisheries, Tasmania, Australia.

Site 5: Solar East – Drainage Line

Depth (cm)	Horizon	Description
0 – 18	A1	Black 10 YR 2/1 **Clay Loam** Weak structure *Gradual transition to:*
18 – 45	A21	Very Dark Grey 10 YR 3/1 **Medium Clay** Weak structure *Gradual transition to:*
45 – 60	A22	Very Dark Greyish Brown 10 YR 3/2 **Heavy Clay** Poor structure *Abrupt transition to:*
60+	B1	Yellowish Brown 10 YR 5/6 **Heavy Sandy Clay** Poor structure *Termination at 100 cm. No auger refusal.*

1% slope, northeast aspect. Pasture consisting of native grasses and flatweed. Spiny rush present. Soil type consistent with the *Canola Association (Ca)* of Doyle (1993).[18] Soils on modern alluvium in depression and valley flats.

[18] Doyle, RB. (1993). *Reconnaissance Soil Map of the South Esk Sheet, Tasmania (southern half).* Department of Primary Industry and Fisheries, Tasmania, Australia.

Appendix II – Water Balance

Mean Rainfall													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Connorville (91019)	38	39	40	49	49	54	66	67	58	53	47	49	610

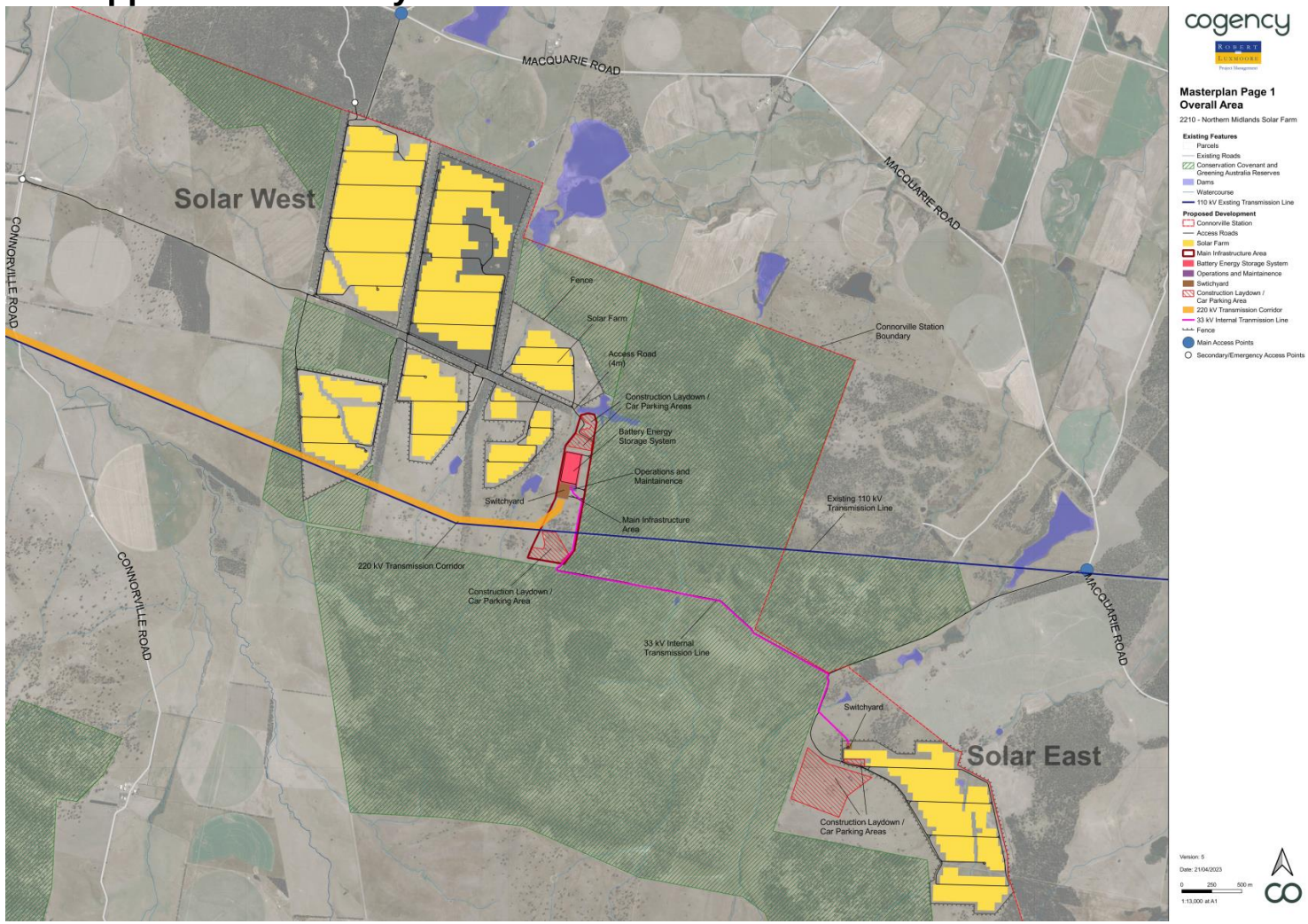
Evaporation data	January	February	March	April	May	June	July	August	September	October	November	December	
Days in month	31	28	31	30	31	30	31	31	30	31	30	31	
Mean daily evap													
Deloraine (091000)	5.7	4.9	3.5	2.2	1.3	0.9	1.1	1.5	2.1	3.2	4.0	4.7	
Mean Evaporation	176.7	137.2	108.5	66.0	40.3	27.0	34.1	46.5	63.0	99.2	120.0	145.7	**1064**

Water Balance for Pasture	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Ave Rainfall	38	39	40	49	49	54	66	67	58	53	47	49	610
Evaporation	177	137	109	66	40	27	34	47	63	99	120	146	1064
Crop factror	1.0	1.0	1.0	0.8	0.7	0.6	0.6	0.6	0.7	0.8	1.0	1.0	
Evapotransporation	177	137	109	53	28	16	20	28	44	79	120	146	
Water deficit/excess	-139	-98	-69	-4	21	37	45	39	14	-26	-73	-97	
Growing season with 80 mm soil water	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Partial	No	

Appendix III – Temperature Data

Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Maximum temperature													
Mean maximum temperature (°C)	25.4	24.9	22.6	18.3	14.8	12.3	11.8	12.9	14.9	17.3	20.5	23	18.2
Highest temperature (°C)	41.4	36	34.4	27.9	21.8	17.7	16.7	19	22	26.6	31.6	37	41.4
Date	30-Jan	3-Feb	16-Mar	3-Apr	4-May	2-Jun	1-Jul	30-Aug	20-Sep	18-Oct	19-Nov	30-Dec	30-Jan
	2009	2000	2008	2021	2005	2005	2013	1999	2019	2017	2009	2019	2009
Lowest maximum temperature (°C)	14.7	15.5	12.4	11.2	7.8	3.6	5.1	6.9	9.2	10	10	14.4	3.6
Date	15-Jan	2-Feb	23-Mar	26-Apr	12-May	27-Jun	4-Jul	2-Aug	4-Sep	17-Oct	8-Nov	3-Dec	27-Jun
	2021	2005	2012	2009	2011	2005	2022	2004	2017	2020	2013	2017	2005
Decile 1 maximum temperature (°C)	20.4	21	18.6	14.7	11.7	9.6	9.5	10.4	12	13.7	16.5	18.3	
Decile 9 maximum temperature(°C)	30	29.4	27	22.1	17.8	15	14	15.4	17.4	21	25.1	27.6	
Mean number of days ≥ 30 °C	3.4	1.8	0.9	0	0	0	0	0	0	0	0.3	1.1	7.5
Mean number of days ≥ 35 °C	0.6	0	0	0	0	0	0	0	0	0	0	0	0.6
Mean number of days ≥ 40 °C	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum temperature													
Mean minimum temperature (°C)	10.4	10.5	8.5	5.7	3.6	1.9	1.7	2.5	3.9	5.2	7.3	8.6	5.8
Lowest temperature (°C)	-0.1	-1	-2.5	-5.4	-6.3	-6.5	-6.4	-6.6	-4.8	-4.9	-2	-2.2	-6.6
Date	9-Jan	28-Feb	26-Mar	20-Apr	22-May	3-Jun	19-Jul	7-Aug	17-Sep	16-Oct	11-Nov	4-Dec	7-Aug
	2009	2002	2005	2015	2008	2005	2015	2006	2019	2006	2001	2008	2006
Highest minimum temperature (°C)	21.1	20	18.9	15.9	13.8	12.7	10.2	11	12.1	15	17.2	19.4	21.1
Date	29-Jan	9-Feb	16-Mar	2-Apr	3-May	6-Jun	1-Jul	31-Aug	29-Sep	31-Oct	3-Nov	20-Dec	29-Jan
	2018	2001	2017	2014	2022	2016	2013	1999	2011	2010	2005	2015	2018
Decile 1 minimum temperature (°C)	5	5	2.7	0	-2.4	-3.7	-3.3	-2.9	-0.9	0	1.9	3.2	
Decile 9 minimum temperature (°C)	15.1	15.5	13.8	11	9.2	7.2	6.5	7.4	8.3	10	11.8	13.1	
Mean number of days ≤ 2 °C	0.6	0.3	2.2	6.6	12.1	16	16.6	14.3	9.4	7	3.4	1.7	90.2
Mean number of days ≤ 0 °C	0.1	0.1	0.6	3.3	7.7	11.6	11.4	9.2	5.3	3	1.2	0.3	53.8

Appendix IV – Study Area Plan



Northern Midlands Solar Farm Project

Aboriginal Heritage Assessment Report

Final Draft Version 1

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