

Our Ref: PNL:ACS:1002900

15 December 2022

Nicole Brewer
Director - Energy Assessments
Development Assessment
Department of Planning and Environment
Locked Bag 5022
Parramatta NSW 2124

Dear Madam

State Significant Development Application SSD-21208499
Glanmire Solar Farm
Site: 4823 Great Western Highway, Glanmire (Lot 141 in DP 1144786)
Submission on behalf of Fitzsummer Pty Ltd

We act for Fitzsummer Pty Ltd (**Fitzsummer**).

We refer to State Significant Development Application SSD-21208499 (**Application**), by which Elgin Energy Pty Ltd (**Proponent**) seeks consent to develop a 60 MW solar farm with a 60 MW / 60 MWh battery energy storage system and associated infrastructure (**Development**).

Fitzsummer is the registered proprietor of land adjoining and adjacent to the Site, being the land known as Lot 1 in DP 839259 at 4887 Great Western Highway, Glanmire, and Lot 11 in DP 1130775 and Lot 12 in DP 1265711 Brewongle Lane, Glanmire (**Land**), as shaded dark green in the aerial image below.



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Executive Summary

Fitzsummer submits that the Application in its current form should be refused for the following reasons.

1. The Biodiversity Development Assessment Report (**BDAR**) fails to adequately address alternatives to modify the proposal and retain remnants of Critically Endangered Ecological Community (**CEEC**) and Serious and Irreversible Impact (**SAIL**) candidate community present on Site. It therefore fails to properly engage in avoidance, being one of the key principles of the *Biodiversity Assessment Method (2020)* (**BAM 2020**).
2. The BDAR fails to provide sufficient information to enable assessment as to whether clearance of hollow trees, being a portion of the critical habitat on the Site for the *Superb Parrot* and *Southern Myotis*, would constitute a SAIL. These species are currently assumed to be present on Site due to a failure to survey for them within the appropriate survey window. The Application should be refused given the failure to avoid impacts on the remnant CEEC and SAIL candidate community present on Site.
3. The Development fails to provide adequate vegetated riparian corridor buffers for the watercourses on the Site in accordance with the NSW Department of Industry *Guidelines for controlled activities on waterfront land: Riparian corridors* (**Riparian Corridor Guidelines**). These guidelines have not been met for all streams on the Site, with first order streams being unbuffered, and the third order stream apparently only buffered by 20m rather than the recommended 30m buffer. The Application should be refused given the non-compliance with the guidelines.
4. The Site is inappropriate for the proposed development. The Development should be located within a Renewable Energy Zone (**REZ**) and does not, in its current location, represent the orderly and economic use of land. In this regard, the Site is mapped in part as Class 3 high capability land under the SEED mapping regime, being important agricultural land requiring a level 3 detailed assessment in terms of site selection for a solar farm. The Application should be refused in the absence of such assessment.
5. The Development will alter the stormwater runoff, water discharge and soil erosion characteristics of the Site. The amount and velocity of overland flow across the Site is expected to increase, requiring appropriate management. Construction itself may result in surface structure decline and require remediation. The flood model in the Environmental Impact Statement dated November 2022 (**EIS**) does not adequately represent and assess the change in site cover from pasture to panels, and the impact this will have on surface water and runoff behaviour. In the absence of proper modelling which adequately represents the alteration of the land surface with solar panels, the Development's impact on the hydrological regime of the Site cannot be properly assessed. The Application should be refused in the absence of a revised flood model assessment.
6. The Large-Scale Solar Energy Guideline dated August 2022 (**2022 Guidelines**) (p35) provide that where a solar energy project is located adjacent to a horticultural or cropping activity, the solar array should be setback from the property boundary by **at least 30m** to mitigate any heat island effect. The Development currently only provides a 10m setback to the adjoining agricultural cropping land. Fitzsummer has

also received advice from an insurance broker that the presence of a solar farm adjoining the Land will cause its insurance premiums to rise substantially. Accordingly, a minimum 30m setback to the boundary between the Site and the adjoining landholdings should be provided to mitigate against the risk of fire and so as to not in any way prejudice Fitzsummer's use and development of the Land.

7. The visual impact of the Development is inconsistent with the objectives and strategic intent of Bathurst Regional Council's (**Council**) planning policies and should be refused pursuant to s4.15(b) and (c) of the *Environmental Planning and Assessment Act 1979 (Act)*, as it will cause unacceptable impacts on the natural environment in the locality.
8. The Visual Impact Assessment prepared by IRIS Visual Planning + Design, dated September 2022 (**VIA**), has not accurately modelled the positioning or scale of the solar panels, or the opacity of the security fence along Brewongle Lane. Accordingly, the full visual impact of, and view loss caused by, the Development has not been appropriately demonstrated. The Application should be refused in the absence of a visual impact assessment which provides a realistic, accurate and complete assessment of the visual impacts of the Development.

Background

Fitzsummer is a family run enterprise that has landholdings throughout NSW. It purchased the Land in 2019.

The Glanmire location was selected due to its potential for high agricultural production, favourable climate, and its proximity to both Sydney and Bathurst. Fitzsummer intends to use the Land to develop and expand its agricultural operations. This will include the improvement of pastures and farm infrastructure to maximise the capability of the Land to finish stock.

Fitzsummer also intends to construct family dwellings on each of the two 300 acre blocks on Brewongle Lane, and to substantially renovate the two existing residences at 4887 Great Western Highway.

Fitzsummer holds a genuine concern that the Development will have a significant detrimental effect on the intended productive agricultural use of the Land, and on the amenity of the Land and the family dwellings. Fitzsummer objects to the Development on this basis.

Fitzsummer has commissioned the following consultant reports:

- (a) *BDAR Review for 4823 GWH Glanmire*, prepared by Cumberland Ecology Pty Ltd dated 9 December 2022 (**Cumberland Ecology Report**);
- (b) *Objection to State Significant Development Application Glanmire Solar Farm (SSD-21208499)*, prepared by GLN Planning Pty Ltd dated 14 December 2022 (**GLN Report**);
- (c) *Review of Environmental Impact Statement (EIS) for the proposed Glanmire Solar Farm, Lot 141 on DP1144786, Glanmire, New South Wales*, prepared by Gilbert & Sutherland Pty Ltd (**G&S**) dated 14 December 2022, (**G&S Agriscience and Land-Use Conflict Report**);

- (d) *Review of Environmental Impact Statement (hydrological impacts), proposed Glanmire Solar Farm, Lot 141 on DP1144786, Glanmire, New South Wales, prepared by G&S dated 15 December 2022 (**G&S Hydrological Report**); and*
- (e) *Review of Visual Impact Assessment, forming part of the Environmental Impact Statement for Development Application Number SSD-21208499, prepared by Urbaine Design Group Pty Ltd (**Urbaine Report**).*

The above experts' reports are **attached** in support of this submission and referenced below.

Ecology

The Cumberland Ecology Report concludes that the BDAR does not conform to the BAM 2020 because it fails to abide by the avoidance principle set out by the BAM 2020.

Specifically, the Cumberland Ecology Report identifies that:

- (a) the Development requires the removal of two remnant patches and several scattered trees of Box Gum Woodland, which is a CEEC and is also considered to be a SAIL candidate community;
- (b) the Development will remove six out of eight (ie 75%) hollow-bearing trees which form critical habitat for threatened species, including the *Superb Parrot* and *Southern Myotis*. These two species are assumed to be present on the Site due to a failure to survey them within their appropriate survey window;
- (c) it is unclear whether there is any remaining riparian vegetation on the Site, as the BDAR has not entailed any flora and fauna investigations, particularly BAM plots, within the larger streams on the Site; and
- (d) the Development fails to comply with the Riparian Corridor Guidelines, which recommend an appropriate vegetated riparian zone buffer for watercourses. The Development only proposes a 20m buffer for the third order stream, instead of a 30m buffer as recommended. In addition, and as shown at Figure 1 of the Cumberland Ecology Report, the Site comprises a number of first order streams. The Riparian Corridor Guidelines recommend that a 10m vegetated riparian zone be incorporated on each side for each first order stream to protect the riparian corridor. This has not been provided.

The Development fails to provide adequate vegetated riparian corridor buffers for the watercourses on the Site in accordance with the Riparian Corridor Guidelines. The Application should be refused given this non-compliance.

The BDAR fails to provide sufficient information to enable assessment as to whether clearance of hollow trees, being a portion of the critical habitat on the Site for the *Superb Parrot* and *Southern Myotis*, would constitute a SAIL. The Application should be refused given the failure to **avoid impacts** on the remnant CEEC and SAIL candidate community present on Site.

These submissions are consistent with recent Land and Environment Court authority,¹ to the effect that where a development is likely to have serious and irreversible impacts on biodiversity values, consent must be refused by reason of s7.16(2) of the *Biodiversity Conservation Act 2016* (**BC Act**). Preston CJ relevantly stated (our **emphasis**):

*[t]he applicant has proposed **no measures to avoid** the impacts of the development on the endangered ecological communities or habitat of the threatened species that occur on the development site, being the northern part of the site zoned R2 that is to be developed for the purposes of a manufactured home estate. The development of this part of the site involves **clearing all** native vegetation, except for a small stand of mangroves to the west adjoining Emigrant Creek. The cleared land will be filled with large volumes of fill and have constructed on the filled land, roads, lots on which manufactured homes will be installed, recreational facilities including a club house, manager's residence, retaining walls and fences, drainage structures and utility services. **The existing endangered ecological communities and threatened species, and their habitats, on this land will be destroyed.***²

Setback

The 2022 Guidelines (p35) provide that *where a solar energy project is located adjacent to a horticultural or cropping activity, the solar array should be setback from the property boundary by at least 30m to mitigate any heat island effect.*

We are instructed that Fitzsummer's agricultural activities involve the growing of crops. Whilst this practice has not been undertaken in recent seasons due to unfavourable weather conditions, it is proposed to occur once the Land is in a suitable condition.

The Applicant has not sought to clarify with Fitzsummer its use of the Land. The 10m setback proposed is inadequate to accommodate the existing and proposed use of the Land.

In addition to protecting Fitzsummer's current use of the Land from the heat island effect generated by the Development, the increased setback will also provide the Development with an increased defensible area from fire (both internal and external). This will, in turn, assist in managing the risk of increased insurance premiums on adjoining landowners caused by the presence of the Development (discussed further below).

Accordingly, Fitzsummer strongly submits that a **minimum 30m setback** to the boundary between the Site and the Land should be provided.

Town Planning, Agriscience and Hydrology

Site Selection

The GLN Report observes that the life of the project and its legacy, which has a proposed life of 40 years, will extend far beyond the scope of the *Central West and Orana Regional Plan 2036* (**CWORP**), which has a horizon of 16 years, and the *Vision Bathurst 2040 Bathurst Region Local Strategic Planning Statement* (**LSPS**), which has a horizon of

¹ *Planners North v Ballina Shire Council* [2021] NSWLEC 120.

² *Planners North v Ballina Shire Council* [2021] NSWLEC 120 at [172].

18 years. These strategic plans identify significant growth for the region and the LGA, with 20.8% growth in population estimated between 2019 and 2036.

State Environmental Planning Policy (Transport and Infrastructure) 2021 (SEPP TI) specifically identifies Bathurst as a regional city, and that the Site is within an area that may need to be protected for future growth. The inclusion of the Site in the SEPP TI Regional Cities Map clearly demonstrates that the assessment needs to consider the potential growth of the city through to the decommissioning of the Development. The GLN Report states that:

- (a) the Application has not considered how the legacy of the Development will continue to affect the land uses that could have been established on the Site into the future;
- (b) the permissibility of development does not constitute site suitability, and in this respect, Bathurst is not a suitable location for a development of this scale – such a development would be more appropriate in the REZ, the closest being the Central West Orana REZ which is located over 55km north-west of the Site; and
- (c) the Site would be best retained as being used for agricultural pursuits, as this will limit any physical constraints to the future consideration of the long term growth of Bathurst as a regional city.

Accordingly, the Site is inappropriate for the proposed development. The Development should be located within the Bathurst REZ and does not, in its current location, represent the orderly and economic use of land.

Agriscience

The Department in the *Large-Scale Solar Energy Guideline for State Significant Development* dated December 2018 (**2018 Guidelines**), acknowledges the importance of site selection stating that '*[g]ood site selection provides an opportunity to avoid or minimise negative impacts at the outset, allowing the design and assessment of a project to focus on mitigating and managing unavoidable impacts.*'

In selecting a site, the 2018 Guidelines indicate that, amongst other things, the following are considered as key constraints for a proposed solar farm development:

- (a) agricultural land with a soil capability class of 1, 2, or 3;
- (b) land with areas of native vegetation or habitat of threatened species or ecological communities within and adjacent to the proposed site;
- (c) sites with high visibility. This is particularly important in the context of significant scenic landscapes; and
- (d) existing infrastructure.

In this regard, the G&S Agriscience and Land-Use Conflict Report states that the Site is mapped in part as Class 3 (high capability land) and Class 5 (moderate-low capability land) under the SEED mapping regime. Class 3 is considered important agricultural land and requires a level 3 detailed assessment in terms of site selection for a solar farm. A detailed

soil survey should be undertaken that meets the minimum requirements outlined in the Guidelines for Surveying Soil and Land Resources (Second Edition 2008) and as identified in the 2022 Guidelines.

The 2022 Guidelines represent current best practice in NSW and should be applied in the assessment of the Application.

The 2022 Guidelines reiterate the importance of the constraints listed above and correctly state (at p19) that such constraints are considerations that '*limit the areas that are suitable for large-scale solar development.*'

The CWORP, which address the strategic vision for the Region, acknowledges that certain areas within the Region are more suitable for solar energy generation, and states that the areas in the Orana Region are suitable for large-scale solar power generation.

Given the Proponent's inadequate site selection, and failure to have regard to the strategic vision for the Region, the Application should be refused on the basis that the Site is not suitable for the Development (s4.15(1)(c) of the Act) and that the Development is not in the public interest (s4.15(1)(e) of the Act).

Hydrology

The G&S Hydrological Report considered the hydrological impacts of the Development.

The Development will alter the stormwater runoff, water discharge and soil erosion characteristics of the Site. The amount and velocity of overland flow across the Site is expected to increase, requiring appropriate management. Construction itself may result in surface structure decline and require remediation. The flood model in the EIS does not adequately represent and assess the change in site cover from pasture to panels and the impact this will have on surface water and runoff behaviour. Revised flood modelling is necessary to determine whether the Development will deleteriously alter the Site's hydrological regime.

In the absence of proper modelling which adequately represents the alteration of the land surface with solar panels, the Development's impact on the Site's hydrological regime cannot be properly assessed. The Application should be refused in the absence of a revised flood model assessment.

Assessment of Off-Site Impacts

The 2018 Guidelines state that a key constraint is the availability of existing infrastructure. Currently there is no adequate network infrastructure available to service the Site.

The EIS states (at p40) that the Development is required to connect to the grid via 66kV infrastructure, however the Site is only serviced by 11kV infrastructure. An upgrade of the 11kV transmission line from the Site to the Raglan Substation is therefore required. Appendix E to the EIS indicates that the total length of the upgrade is approximately 7km.

Further, additional works are required to upgrade the Raglan Substation.

The EIS is clear that Essential Energy, being the relevant utility provider, is required to agree to undertake the network upgrade works outlined above. Essential Energy has not confirmed if or when it is prepared to undertake the work required to enable the Development to connect to the grid. Essential Energy has also not confirmed the scope or footprint of the upgrade works. The only confirmation that Essential Energy has provided is that there are options available to facilitate a connection.

The Proponent has no control over the upgrade works, as the works will be undertaken by Essential Energy.

It is also not clear whether the upgrade works are able to be undertaken within the existing transmission line easements, or whether new or amended easements will be required.

The EIS also makes no reference to whether the Proponent has secured an energy off-take agreement with Essential Energy.

As a matter of law, s4.15(1)(b) of the Act requires the Department to consider the impacts of the Development. This includes both site specific impacts and off-site impacts.³ It is not relevant that the upgrade works will form the subject of a separate approval process, what matters is that those further works are inextricably involved with the Development.⁴

As discussed above, the upgrade works are required to enable the commercial operation of the Development.

Whilst it is acknowledged that the Proponent has included a 'high level environmental assessment' of the potential upgrade works at Annexure E to the EIS, it is submitted that the assessment is not adequate.

The EIS confirms that Essential Energy has not confirmed what, if any, works will be undertaken to provide the necessary upgrades to the network infrastructure. On this basis, the Department cannot form the requisite level of satisfaction required by s4.15(1)(b) of the Act in relation to the likely impacts of the Development, as the upgrade works which are ultimately approved and undertaken may be completely different to those contemplated by the 'high level assessment'.

In the absence of a complete and detailed assessment of the actual upgrade works necessary to connect the Development to the electricity grid, the Application must be refused.

Visual Impact

The issues raised in the VIA are summarised as follows.

Visual Impacts Inconsistent with Planning Controls

The EIS misrepresents how a number of local planning instruments and documents seek to protect the visual amenity of the Bathurst Region. In particular, the EIS states that the Site is not located in a '*visually significant portion*' of the Bathurst Plains.

³ *Ballina Shire Council v Palm Lake Works Pty Ltd* [2020] NSWLEC 1 at [6].

⁴ *Bell v Minister for Urban Affairs and Planning* (1997) LGERA 86 at 101.

The EIS selectively quotes and cites Part 6.3.2d of the *Bathurst Region Vegetation Management Plan 2019 (BRVMP)* as the source to establish that the Site is not part of a 'visually significant portion' of the Bathurst Plains. Part 6.3.2d is extracted in its entirety below (emphasis added):

*The Bathurst Plains **are typified by a treeless landscape** and provides a contrast to the built-up area of the urban environment. **They are viewed from the eastern approach to Bathurst City and are particularly significant as a natural gateway feature**. The Bathurst Plains include Eglinton and Laffing Waters which are surrounded by undulating to steep hills. Views of the plains are also seen from Perthville.*

*Note that the extent of the Bathurst Plains as indicated in Map B is **indicative only**, and **represents a portion of the area visually significant from the eastern gateway approach**.*

Map B of the BRVMP, only indicates a very small portion of the land comprising the Bathurst Plains as visually significant, mapping the remainder of the land as unsurveyed. Accordingly, given the Site's prominent location in the heart of the eastern gateway approach to Bathurst City, it ought to be considered as particularly visually significant along with all the land on the Bathurst Plains.

In addition to the above, the EIS (p106) misquotes the CWORP by stating that it acknowledges the entire Central West and Orana region's potential for large-scale solar energy. The entire quote from the CWORP is extracted below.

The region has significant potential for renewable energy industries with vast open spaces and higher altitude tablelands with potential for wind power generation, large-scale solar energy and bioenergy generation.

Areas in the Central West, including Blayney, Oberon and Wellington, are suitable for wind energy generation, while areas in the Orana, such as Warren, Coonamble and Bogan, are suitable for large-scale solar power and geothermal energy generation.

The CWORP is clearly stating that it is those areas in the Orana region, which are suitable for solar power generation, being areas where the landholdings are generally materially larger than in the Bathurst Region.

The CWORP does reference the important rural landscape value, as referenced in the EIS (p106), in the context of land use compatibility. In this regard, Bathurst is cited as being an area where land use compatibility needs to be carefully considered as it is a closely settled area.

The EIS (p106 – 107) goes on to cite a number of other local planning instruments which emphasise the significance of the rural and scenic character of the land and the importance of protecting that land. These include:

- (a) SEPP TI;
- (b) LSPS;

- (c) BVPM;
- (d) *Bathurst Regional Local Environmental Plan 2014 (BRLEP)*;
- (e) *Bathurst Regional Development Control Plan 2014 (BRDCP)*; and
- (f) *Bathurst Region Rural Strategy 2010 (BRRS)*.

Contrary to the clear position of Council that the area comprising the Site is of high aesthetic value and ought be protected, the Proponent states that the Site is of:

- (a) low scenic quality; and
- (b) moderate landscape sensitivity (only due to the planning provisions).

The EIS concludes that there would be no significant impact on the scenic quality or visual character. In light of the above, this conclusion cannot be accepted.

As mentioned above, the Site is within the eastern gateway approach to Bathurst, which is considered by the BRVMP to be an area of visual significance to the Bathurst Region.

Further, the BRRS states, at part 6.2, that all key scenic drives include '*[a]ll drives from Bathurst to all village and settlement locations and drives between villages and settlement locations.*' The Site adjoins Brewongle Lane, which forms part of a drive from Bathurst to Brewongle Village.

On the basis of the above, it is clear that the visual impact of the Development is inconsistent with the objectives and strategic intent of Council's planning documents and should be refused pursuant to s4.15(b) and (c) of the Act, as it will cause unacceptable impacts on the natural environment in the locality and the Site is not suitable.

Failure to Assess Impacts

The visual impact assessment undertaken by the Proponent fails to consider visual impact:

- (a) of the upgrade in the infrastructure; and
- (b) on Mount Panorama.

The Urbaine Report further identifies the following deficiencies in the VIA:

- (a) the VIA has not accurately modelled the height of the solar panels, or the scale and solidity of the security fence along Brewongle Lane, so that the full visual impact of, and view loss caused by, the Development has not been appropriately demonstrated or assessed;
- (b) the mature landscape, which, according to the VIA will develop in around 10 to 15 years, will obscure the views of the rolling hills to the south of the Development, while also failing to conceal a large portion of the solar panels. In addition, these proposed plantings will create an unnatural feature within the landscape, which does not relate to the surroundings or to the overall variety and topography of the land;

- (c) the magnitude analysis diagram fails to reflect that a portion of the solar panels and security fence will remain visible, particularly if deciduous trees and vegetation are incorporated;
- (d) the visual impact analysis summary for viewpoint 1 categorises the Impact Rating as low, however many elements have not been accurately portrayed in the photomontaged images;
- (e) viewpoint 2, being the view west from the Great Western Highway, fails to include what is arguably the most critical portion of the view, being the north-eastern corner of the Site at the junction of Brewongle Lane and the Great Western Highway. From this view, the solar panels, at up to 350mm high, will be visible, as will the substation and associated infrastructure. The VIA does not assess the visibility of the substation;
- (f) the gateways into the urban areas of the City, particularly along the Great Western Highway and Mitchell Highway, have undergone new plantings under the BRVMP, to achieve a strong unified landscaped environment that recognises the transition between the rural and urban landscapes, with natives merging to exotics. The VIA has failed to adequately assess the impact along these two main approach roads;
- (g) the alignment of the distant skyline in viewpoint 3 is noticeably inaccurate, which will result in a CAD model position lower than and horizontally misaligned with the original photograph. The inaccurate survey overlay therefore misplaces the model of the solar panels in this photomontage view. This has the effect of certain elements being shown on the western side of the site, when in fact they should be on the eastern side, and vice versa;
- (h) the VIA failed to consider the impact on the upgraded utility poles, which will likely be made of concrete and will be between 2m and 6m higher than the existing poles along the Great Western Highway;
- (i) the topography indicated for viewpoint 4, being the existing view from South Mersing Road, is different to that shown in the EIS. Nevertheless, based on the elevation of the image, the solar panels would be visible and mitigation measures are necessary;
- (j) in many instances the VIA has not appropriately represented the assessment of glare in relation to the visibility of the solar panels, which means that the glare assessment values in the EIS are incorrect.

Given the significant inaccuracies in the VIA, the Application should be refused as the Department is unable to assess the likely visual impact of the Development.

Insurance

The EIS (pg217) identifies the concern expressed by the community that insurance premiums of adjacent properties may be affected by the increased value of assets at the solar farm.

Fitzsummer has had advice that its current public liability insurance is inadequate to cover the risks presented by the Development, and that coverage of at least \$50million, together with a \$50million excess, is necessary to mitigate the increased risk.

In addition to increased premiums, it is also likely that Fitzsummer will have conditions imposed on its insurance which will restrict certain types of activities from being conducted on the Land, so as to further mitigate the risk of fire igniting and spreading to the Development.

As discussed above, the 2022 Guidelines require a 30m boundary setback to mitigate the risk of heat island effect. Such a setback would also reduce the risk of fire spread and assist in mitigating any additional insurance costs or restrictions caused by the presence of the Development.

Inadequate Provision for Public Benefit

The 2022 Guidelines discuss the concept of benefit sharing (section 5.3), noting that any benefit from large-scale solar energy development is not directly realised by the local and regional communities that host and are impacted by such development. The 2022 Guidelines relevantly state (pg27):

... Solar infrastructure, especially when it is large scale, can result in changes to the local landscape and community that are difficult to foresee and plan for.

Sharing the financial and other benefits of a project can assist in building community support by ensuring that the project delivers positive, tangible and long term social and economic outcomes for the local community.

Consequently, the NSW Government strongly supports benefit sharing programs, and will continue to investigate how benefits could be better coordinated for communities.

The Application does not propose adequate benefit sharing or otherwise provide certain and enforceable measures to deliver tangible and long-term social and economic benefits for the local community.

The EIS (pg56) states that “*there are [sic] no VPA in place for the Project at this stage however one will be developed in relation to the Community Benefit Sharing Scheme with Bathurst Regional Council*”.

The EIS (pg96) also states that in October 2022, the Proponent contacted Council to confirm that it would, among other things, “*pay a VPA [sic] of \$18,000 per year for the life of the project*” and “*commit to work with Council to set up a benefit sharing scheme that will utilise these funds to go to local initiatives and draft a VPA with Council to submit prior to determination*”.

The local community can take no comfort from the above statements in the EIS. No irrevocable letter of offer or draft VPA with Council or the Department accompanies the Application. The Proponent has provided no written evidence of Council’s willingness to enter such a VPA.

Accordingly, the Proponent's remarks in the EIS regarding its 'commitment' to providing a Community Benefit Sharing Scheme should be given little weight. The Application should be refused in the absence of a certain and enforceable regime for the provision of a tangible material public benefit to the local community.

Yours faithfully



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9 December 2022

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BDAR Review for 4823 GWH Glanmire

Dear Paul,

We have reviewed the Biodiversity Development Assessment Report (BDAR) and the ecological effects for this project including potential impacts on threatened ecological communities (TECs), wildlife habitat, and waterways. The primary aim of this review was to determine if the BDAR complies with the Biodiversity Assessment Method (2020) and the Biodiversity Conservation Act 2016.

Our findings are outlined in **Appendix A**. If you have any questions please do not hesitate to contact either myself or Angela Mees on (02) 9868 1933.

Yours sincerely



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APPENDIX A :

BDAR Review

A.1. Background

Cumberland Ecology was commissioned to undertake a peer review of the BDAR and Environmental Impact Statement (EIS) relating to the proposed Glanmire Solar Energy Project. A series of figures reproduced from the BDAR is provided as an attachment to this letter. The figures show:

- **Figure 1** Location Map;
- **Figure 3** Development Layout
- **Figure 17** Species Polygons for species assumed by the authors of the BDAR to occur
- **Figure 23** Plant Community Types

The documentation was prepared to support the construction, operation and eventual decommissioning (over a total timespan of approximately four decades) of a proposed solar farm at Lot 141 DP1144786, in Glanmire, NSW - located approximately 10km east of the centre of Bathurst (**Figure 1**). The proposed design for this project aims to utilise the bulk of the land and can be seen in **Figure 3**.

A.2. BDAR Review

The primary aim of this review was to determine if the BDAR complies with the Biodiversity Assessment Method (BAM 2020) and the Biodiversity Conservation Act 2016. Our main findings focus on three areas, the impacts of the project on TECs, wildlife habitat, and waterways.

A.2.1. Impact on Threatened Ecological Communities

According to the BDAR the project will remove two remnant patches (0.65 ha) of the plant community type (PCT) 1330 Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion. These patches were found to conform to the BC Act listing of the threatened ecological community (TEC) 'Bioregion White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions' (hereafter Box Gum Woodland).

The vegetation as described in the BDAR largely comprises scattered trees of belonging to Yellow Box (*Eucalyptus melliodora*) and Blackley's Red Gum (*Eucalyptus blakelyi*) trees. Of the trees that occur on site, most are in the areas proposed for development, and will be cleared. Moreover, it is evident from the BDAR that trees with hollows that occur on site are in the area proposed for clearing.

If implemented as shown in **Figure 3** the major occurrence will be almost entirely cleared. However, there is potential to modify the proposed development design, have less solar panels, and retain the trees, including all hollow trees.

Box Gum Woodland is a Critically Endangered Ecological Community (CEEC) within NSW. Remnants of this community are known to support many species of threatened fauna and flora.

Box Gum Woodland occurs in lands that are now intensively farmed and so many remnants are extensively cleared and modified. For this reason, the final determination recognises and covers sites with trees only, and sites with ground stratum only, as well as sites with the full complement of vegetation strata.

Box Gum Woodland is also considered a Serious and Irreversible Impact (SAIL) candidate community, meaning that NSW has recognised this community is at serious risk of extinction. For SAIL candidate communities, the Biodiversity Offset Scheme (BOS) prescribes that consent authorities consider whether the likely ecological impact is outweighed by the social and economic benefits that the development will deliver to the State.

Remnant Box Gum Woodland trees with hollows are in relatively short supply in many farmland areas. Therefore, the trees with hollows are an important wildlife resource. The BDAR has not demonstrated why the proposal will not have a significant and irreversible impact on Box Gum Woodland if all of the larger trees on site with hollows are cleared.

A.2.1.1. Conclusion

While investment in solar energy does provide social and economic benefits, consideration must be given to the trade-off, in this case, of reducing the amount of solar panels in this project to protect these remnants of a CEEC/SAIL community. The BDAR fails to adequately discuss this, despite the obvious opportunity to modify the proposal and retain the trees. It therefore fails to engage properly in Avoidance, one of the key principles laid out by BAM 2020. It also does not provide sufficient information to judge whether or not clearance of the hollow trees would constitute a SAIL.

A.2.2. Impact on Wildlife Habitat

The proposed development will remove two remnant patches of Box Gum Woodland and surrounding scattered trees. In total, 13 trees, including six hollow-bearing trees (HBT) will be removed by the proposed development while only two large HBT will be retained in the riparian buffer that intersects across the subject site (**Figure 23**). Therefore, 6/8 HBT, or 75% of the hollows will be cleared.

There are several fauna species that were evaluated as likely to occur on or use the development footprint by the BAM calculator. While surveys by AREA failed to find any of these threatened fauna, it is important to note two main considerations:

1. Threatened species are not always present and therefore their absence cannot be confirmed due to absence in short survey windows; and
2. The Superb Parrot (*Polytelis swainsonii*) and Southern Myotis (*Myotis macropus*) were not surveyed within their recommended period and therefore must be assumed as present.

The Superb Parrot is listed as being threatened by the loss of living and dead hollow-bearing trees, alongside the poor regeneration of nesting trees and food resources. As a result, the targeted strategy for managing the Superb Parrot under the Saving our Species Program lists the following as a critical action for this species: "Retain living and dead paddock trees and plant or direct seed appropriate local eucalypt species, particularly white box, yellow box, Blakely's red gum and river red gum, to replace these trees in the long-term." When determining the habitat polygon for this species, a circular buffer (100m) must be placed around identified

breeding sites. Given that this species has not been surveyed in the correct window, a conservative habitat polygon would include a 100m buffer around each HBT rather than including the HBT only as done in the BDAR.

Likewise, the Southern Myotis is listed as being threatened by the disturbance of roosting sites. This species roosts in hollow-bearing trees, as well as other protected structures. As a result, the targeted strategy for managing the Southern Myotis under the Saving Our Species Program lists the following as a critical action for this species: *"Retain and protect live and standing dead trees likely to contain suitably sized hollows, or that have the potential to develop these in the future (e.g. through the loss of limbs) particularly in riparian zones. Ensure the largest hollow-bearing trees, including dead trees, are given highest priority for retention in property vegetation plan assessments."*

A.2.2.1. Conclusion

In conclusion, the proposed development removes a significant portion of critical habitat on the subject site for the Superb Parrot and Southern Myotis (**Figure 17**). Current literature states that hollows of this size can take over 100 years to form. Consideration must be given to the trade-off, in this case, of reducing the amount of solar panels in this project to protect critical habitat for threatened species. The BDAR fails to discuss this, and therefore fails to engage properly in Avoidance, one of the key principles laid out by BAM 2020.

A.2.3. Impact on Waterways

The subject site contains eight non-perennial waterways of first or second Strahler order streams, and one in the south that is a perennial waterway, which is a third or possibly fourth order stream (**Figure 1**). The NSW government has published the Guide to completing and submitting a new or amended controlled activity approval. This guide describes development on waterfront land.

The BDAR has not entailed any flora and fauna investigations, particularly BAM plots, within the larger streams on the subject site. It is therefore unclear whether or not there is any remaining riparian vegetation. If there is riparian vegetation it should be protected and restored via management. If it is absent, there needs to be provision for replanting via prescriptions in a Vegetation Management Plan (VMP). Such management measures should be permanent/ongoing. No such VMP has been provided.

The NSW Department of Industry have published the 'Guidelines for controlled activities on waterfront land: Riparian corridors'. This guideline recommends the appropriate vegetated riparian zone (VRP) buffers for watercourses (**Table 1**). These guidelines have not been met for all streams on the proposed development, with first order streams on site unbuffered and the third order stream apparently only buffered by 20 m rather than the recommended 30 m.

See **Table 1** overpage.

Table 1 Recommended riparian buffer for 1st and 2nd order watercourses

Watercourse Type	Width of VRP (each side of watercourse)
First order	10 metres
Second order	20 metres
Third order	30 metres
Fourth order	40 metres

A.2.3.1. Conclusion

The proposed development provides protection in the form of a buffer for two of the streams on site, but not for any of the others. It therefore fails to meet the appropriate riparian buffer guidelines.

A.3. Conclusion

The project, in its current form, requires the removal of two remnant patches and several scattered trees of Box Gum Woodland, a CEEC and SAI candidate community. Additionally, it will remove six out of eight HBTs which form critical habitat for threatened species. Two of these species, the *Superb Parrot* and *Southern Myotis* are currently assumed to be present on site due to a failure to survey them within their appropriate survey window.

It is appropriate to say that this development could therefore cause SAI in its current form. Altering the project to avoid these areas would allow for the retention and rehabilitation of key habitat. In failing to do so, this project has failed to abide by the Avoidance principle set out by BAM 2020 and therefore this BDAR cannot be said to conform to the BAM 2020.

The majority of mapped first order streams on the subject site will also be covered by solar panels and will not be protected by any buffers.

The two streams that are currently protected by a buffer, and some proposed planting/screening areas should be managed in perpetuity for flora and fauna values. However, there is no draft VMP provided with the EIS to show how this will be achieved. It is important for a VMP to be drafted to show the nature and extent of retained vegetation, and also the composition and future management of proposed plantings.

FIGURES

Figure 1 Location Map

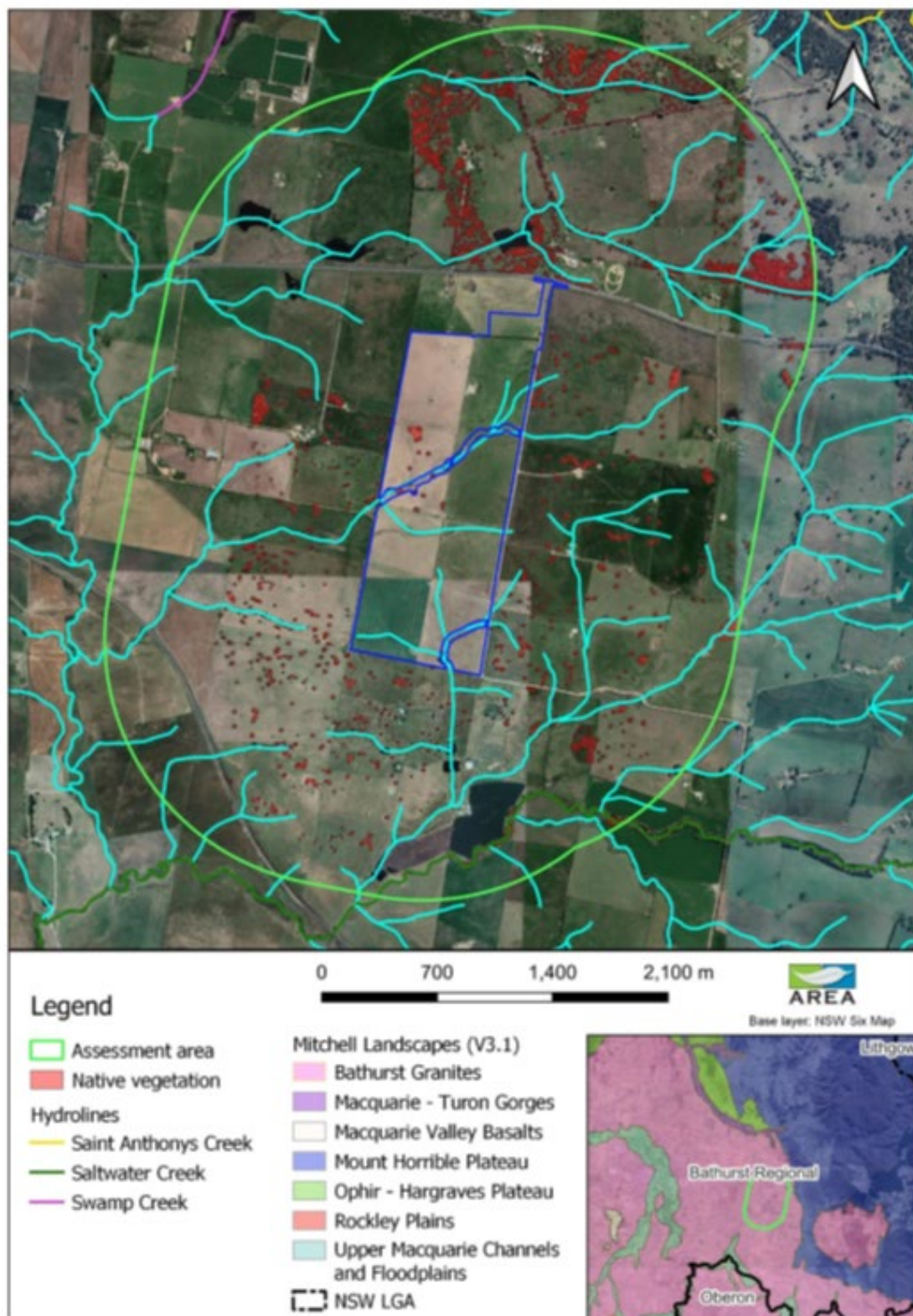


Figure 3 Development layout

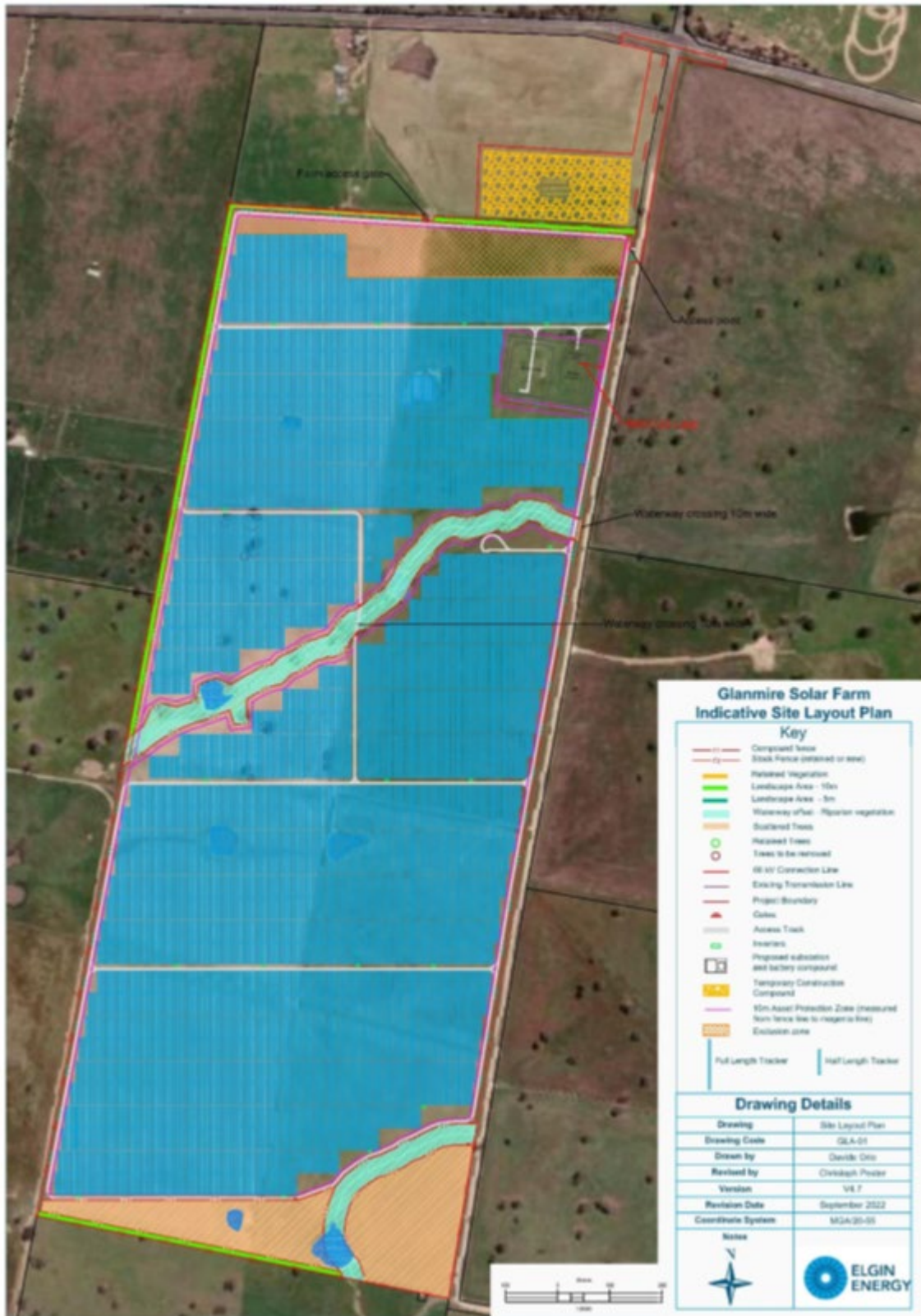


Figure 17 Species Polygons (for species assumed to occur)



Figure 23 Plant community types



14 December 2022

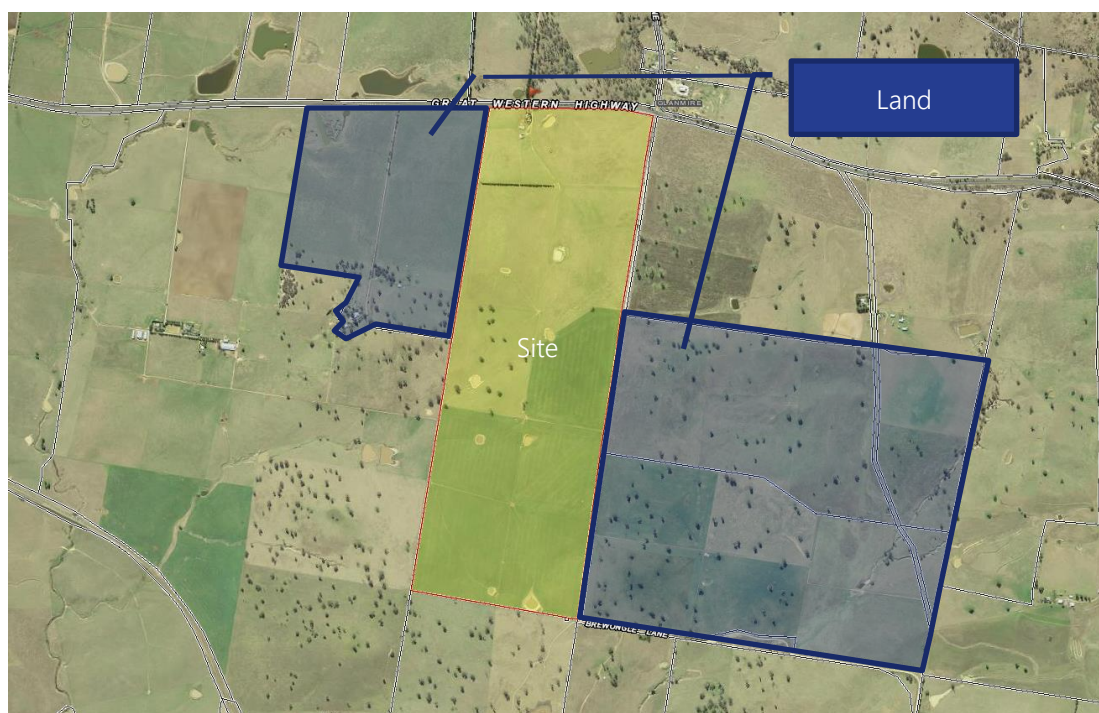
Our Ref: GLN11530 Submission to EIS

Paul Lalach
Partner
HWL Ebsworth Lawyers,
Level 14, Australia Square,
264-278 George Street,
Sydney NSW 2000

Dear Paul Lalach

RE: Objection to State Significant Development Application Glanmire Solar Farm (SSD-21208499)

We have been asked by Fitzsummer Pty Ltd, the owners of Lot 1 DP839259 at 4887 Great Western Highway, Glanmire, and Lot 11 DP1130775 and Lot 12 DP1265711 Brewongle Lane, Glanmire (the **Land**) (see **Figure 1**) to undertake an assessment of the Environmental Impact Statement (**EIS**) made by Elgin Energy (the **Applicant**) over Lot 141 DP1144786 at 4823 Great Western Highway, Glanmire (**Site**) as well as affecting land in the Brewongle Road Reserve and Great Western Highway.



Source: SIXMaps (as modified by GLN)

Figure 1 Site identification map



We understand that this submission will be collated by HWL Ebsworth with other specialist reports/submissions to provide a holistic assessment of the proposal. This submission considers the EIS prepared by NGH dated November 2022 and supporting information and provides our comment on the proposal in the context of the town planning framework and considerations that should be applied in the assessment of the proposal.

The purpose of this submission is to ensure that the proposal has considered the relevant policy and guidelines set by the NSW Government, to ensure that the development is suitable for the land and does not unreasonably restrict or impact on the surrounding locality.

The proposal is for the "Glanmire Solar Farm", which can be defined under the *State Environmental Planning Policy (Transport and Infrastructure) 2021 (SEPP TI)* as

- "electricity generating works", being;
"A building or place used for the following purposes, but does not include a solar energy system –
 - (a) Making or generating electricity,*
 - (b) Electricity storage".*
- "Associated electricity transmission or distribution network" which includes the following components;
 - (a) "Above or below ground electricity transmission or distribution lines (including related bridges, cables, conductors, conduits, poles, towers, trenches, tunnels, access structures, access tracks and ventilation structure) and telecommunication facilities that are related to the functioning of the network*
 - (b) Above or below ground electricity switching stations or electricity substations, feeder pillars or transformer housing, substation yards or substation buildings,*
 - (c) Systems for electricity associated with a component specified in paragraphs (a) and (b)".*

The SEPP TI permits the proposal on the Site with consent on account the land is zoned RU1 Primary Production.

Based on our review of the EIS and associated information we have identified a number of areas of oversight. This submission raises those considerations that must be applied by the DPE in its assessment of the proposal.

Capacity for Growth – Site Suitability

Along with a raft of recent policies and strategies developed by the NSW Government to encourage the delivery of appropriate energy infrastructure across the State, specific controls have been adopted within the SEPP TI to assist in the consideration of sites for this form of development. This includes clause 2.42 of the SEPP TI that applies to applications for solar or wind electricity generating works on certain land. The clause requires that consent must not be granted



for a State Significant Development (**SSD**) unless the consent authority is satisfied that the development is unlikely to have significant impact on a regional city's **capacity for growth**. The SEPP TI specifically identifies Bathurst as a regional city, and the Site within the area the subject of this control. Therefore the Site is in an area that may need to be protected for future growth (see **Figure 2**).

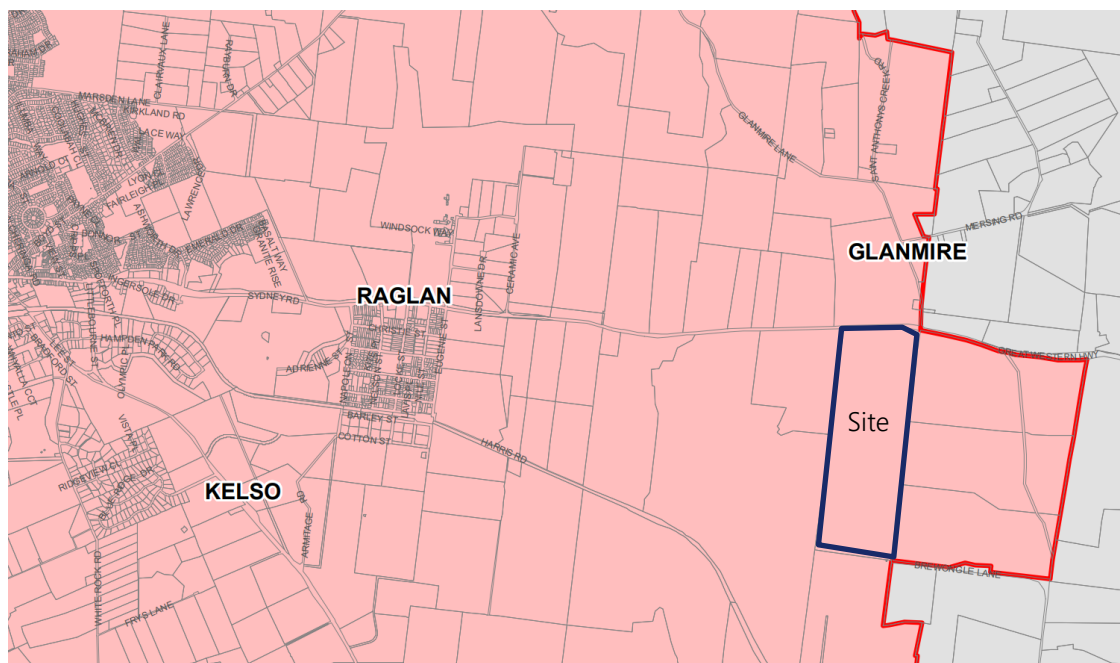


Figure 2 Extract from SEPP TI Regional Cities Map – Bathurst – Sheet REC_003

The EIS has gone into considerable detail to review the proposal in the context of the existing strategic plans including the Central West and Orana Regional Plan 2036 (**Regional Plan**) and Vision Bathurst 2040 Bathurst Region Local Strategic Planning Statement (**LSPS**). These plans have been established to guide future development of the Central West and Orana Region as well as the greater Bathurst Local Government Area (**LGA**). These strategic plans identify significant growth for the region and LGA, with the LSPS forecasting a 20.8% growth in population between 2019 and 2036 alone.

The vision of the Regional Plan is to deliver the most diverse regional economy in NSW. To achieve this, the Regional Plan acknowledges that the Region needs to build on connections to the larger metropolitan cities to the east, which in relation to Bathurst places strategic importance on the Bathurst Airport, the Main Western Railway Line and Great Western Highway. In recognition of fostering appropriate growth and the existing demand around this existing road and airport infrastructure the LSPS includes "Gateway Investigation Areas" heading east along the Great Western Highway towards (but not including) the Site (see **Figure 3**).

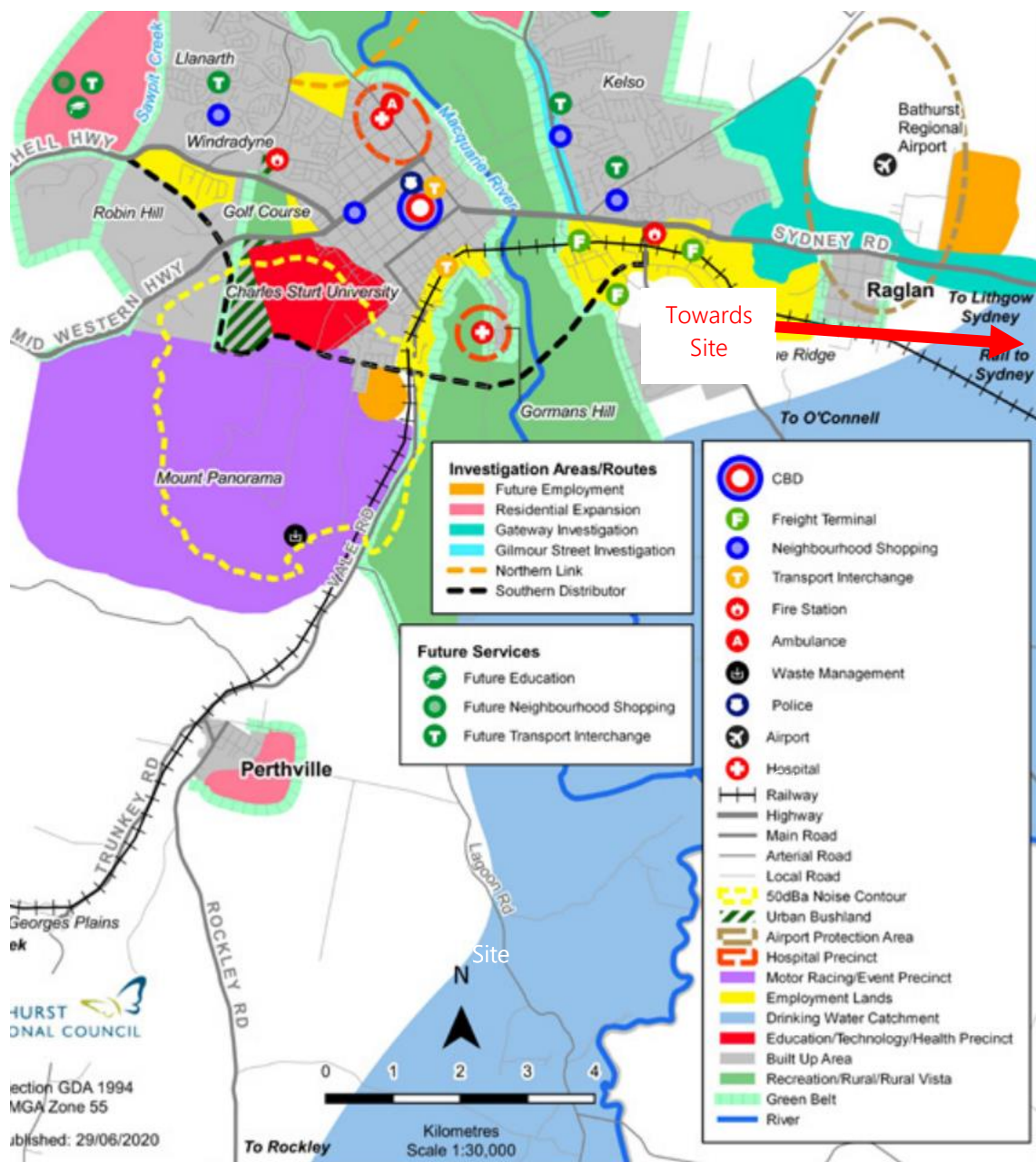


Figure 3 Extract of LSPS - City of Bathurst Structure Plan

Despite the proposal not affecting any specific areas identified for future growth in these strategic planning documents, **the life of the project and its legacy will extend far beyond the scope of the Regional Plan and LSPS**. Therefore, in accordance with the identification of the Site in the Regional Cities Map of the SEPP TI, the assessment of the suitability of the Site for the proposal must consider the potential use of this land far beyond the horizon of these strategic documents and consider whether this Site's strategic location in relation to the highway, railway and airport (see **Figure 4**) would see it better retained and protected for alternative uses given its strategic



location. The inclusion of the land in the SEPP TI Regional Cities Map clearly demonstrates that the assessment needs to consider the potential growth of the city up to this point.

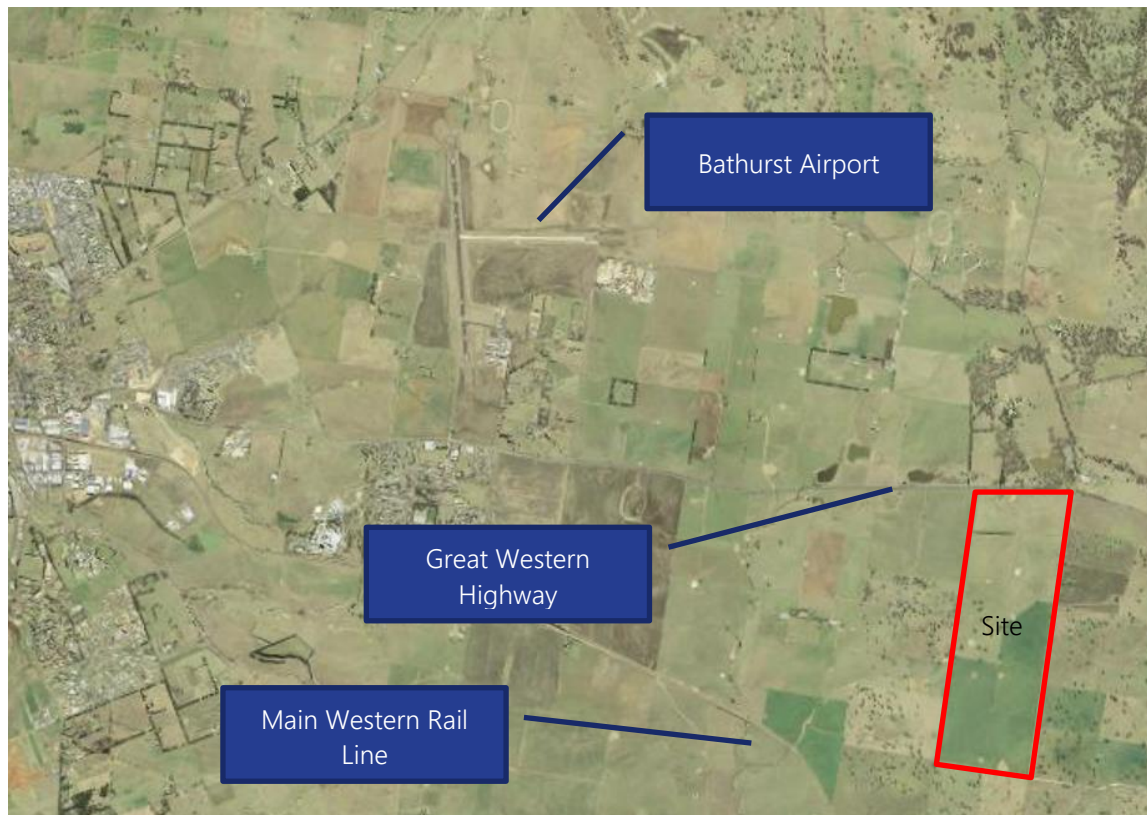


Figure 4 SIX Maps Aerial Imagery - Surrounding transport infrastructure

The proposal outlines that the life of the project is approximately 40 years (pg. 4 of the EIS), whilst the Regional Plan and LSPS only have a horizon of 16 and 18 years respectively. Furthermore, although the proposal outlines that the Site will be decommissioned after 40 years, only parts of the development will be decommissioned with the balance of the associated infrastructure remaining indefinitely. The following associated infrastructure has not been specifically included in the decommissioning of the project:

- 0.8ha area containing the 66kV substation and Battery Energy Storage System (BESS).
- Upgraded refurbished/augmentation of existing 11kV transmission infrastructure to 66kV.
- Any underground cabling located below a depth of 500mm – which appears to be all underground cabling, as section 3.2.5 of the EIS details all underground low voltage cabling will be at a depth of 600mm and all high voltage underground cabling will be at a depth of 800mm.

The abovementioned infrastructure carries with it restrictions that affect surrounding land. The substation will have an exclusion and asset protection zone that will continue to apply once the solar panels have been removed, whilst the 66kV transmission lines require larger easements and restrictions than the existing 11kV infrastructure. Restrictions around the works that can be done



to the land around and above the underground cabling will also remain. The proposal has not considered how the legacy of the project will continue to affect the land uses that could be established on this land into the future.

The Site's position between the airport, rail line and location on the Great Western Highway make it a long term strategic location. This long term position may not be realised in the next 20 years, however the project requires the consideration of potential land use and impacts far beyond the 20 year time frame of current strategic land use planning. We would suggest that the Department's identification of the Site in the Regional Cities Map of the SEPP TI that a large scale energy generating development of this form of development would be generally suited elsewhere, such as a "Renewable Energy Zone" (**REZ**).

More suitable land uses should be retained on the Site to protect the long term growth opportunity of Bathurst, particularly on land in the vicinity of major transport routes. Suitable land uses would be those that avoid, or keep physical constraints (such as permanent infrastructure) to a minimum. This reduces the restrictions to consider in the future planning of the expansion of Bathurst along these transport corridors. The Site would therefore be best retained as being utilised for agricultural pursuits, as it limits any physical constraints to the future consideration of the long term growth of Bathurst as a Regional City.

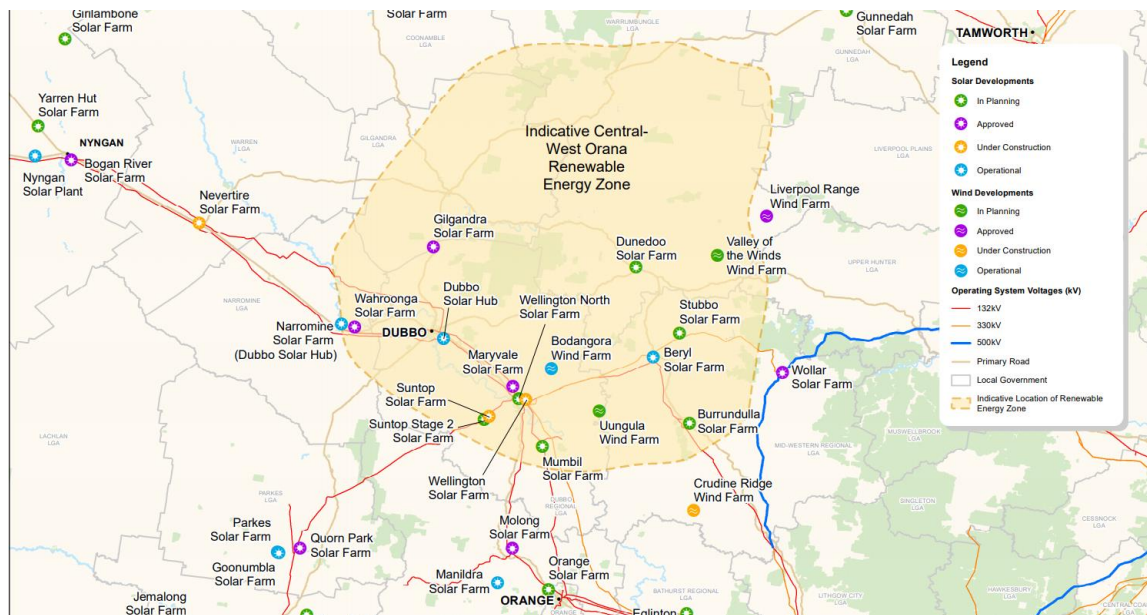
Inadequate Site Selection

The Applicant details that the Site was selected utilising the guideline applicable at the time being the "Large-Scale Solar Energy Guideline" dated December 2018 (**2018 Guideline**), which was replaced by the Large Scale Solar Energy Guideline dated August 2022. A "Key assessment issue" identified within the 2018 Guideline includes "Strategic context" being whether a project is consistent with the relevant planning strategies. The Regional Plan forms a large component of the strategic context for the Site.

There is no conjecture that the Regional Plan encourages growth in solar energy production and that the SEPP TI permits the use in the zone, however permissibility of development does not constitute site suitability. The Regional Plan specifically identifies areas in the Orana region such as Warren, Coonamble and Bogan which are suitable for large scale solar power energy generation. Bathurst has a lower Average Daily Solar Exposure than other areas in the region and is identified as having high value agricultural land and transport infrastructure that need to be protected. Bathurst is not a suitable location for a development of this scale.

The State Government through the NSW Electricity Strategy has identified suitable land and existing infrastructure for large scaled renewable energy developments within REZs. The closest identified REZ to the Site is the Central-West Orana REZ (see **Figure 5**), which is located over 55kms north west of the Site. The REZ is being established to complement existing agriculture and primary land uses, reflect local priorities and retain existing economic and social values. The NSW Government is working on incentives and schemes to support investment in renewable energy providers in the REZ.

The establishment of REZ's are to coordinate the development of renewable energy generators in suitable areas. We would continue to suggest that a development of this scale and the long term legacy would be better suited to a REZ, where the long term impacts of this form of development are considered suitable and would not have the potential to affect the long term growth of Bathurst.



Source: Energy NSW

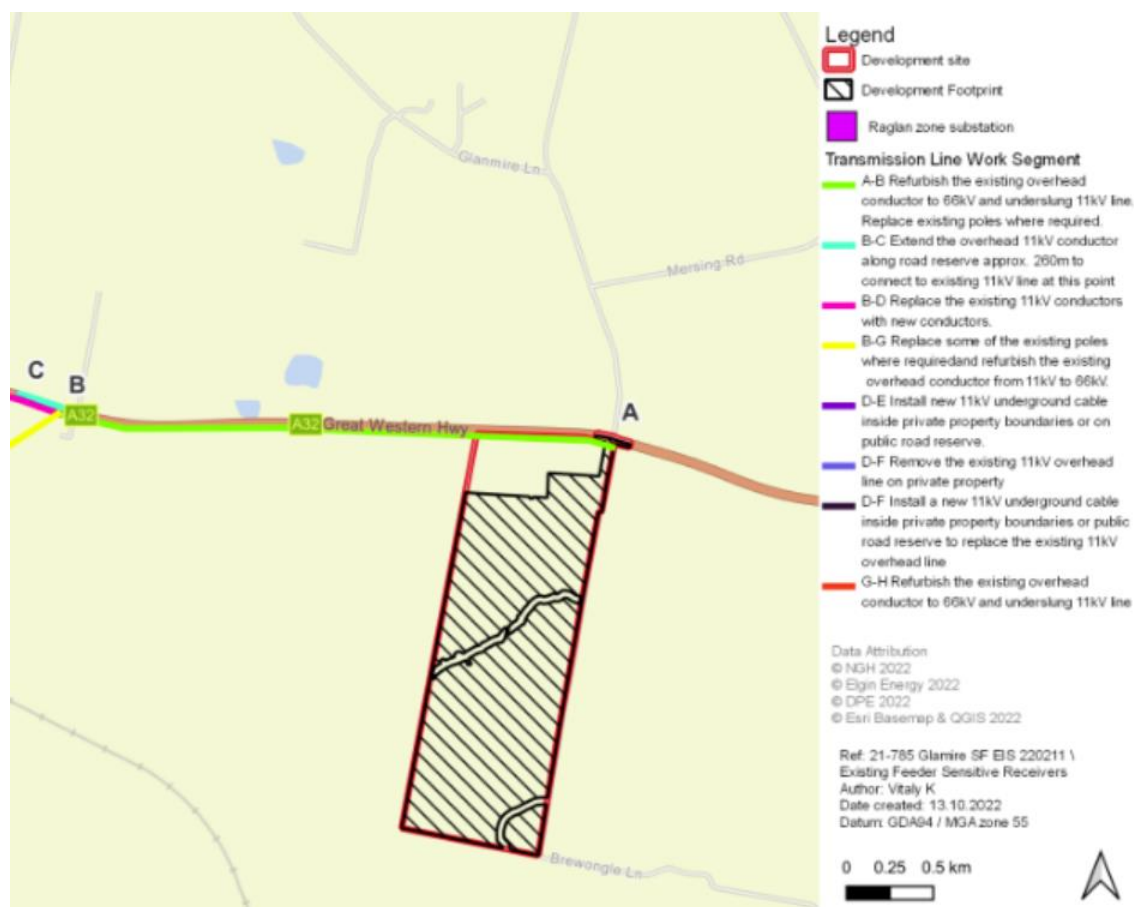
Figure 5 Central-West Orana REZ

Scenic Quality and Landscape Character – Transmission Lines and Poles

In addition to ensuring development does not have any significant impact on Bathurst's capacity for growth, clause 2.42 of the SEPP TI also states that consent must not be granted unless a consent authority is satisfied that the development is unlikely to have significant adverse impact on the scenic quality or landscape character of the town.

The EIS is supported by several visual analysis' including from adjoining properties and the Great Western Highway. Whilst we understand that the owner of the Land has engaged a visual impact expert to prepare a submission to the visual impact assessment, based on our review the visual impact assessment has only considered the visual impact of the solar farm on the land. It is stated throughout the EIS and in the supporting documentation that the proposal will require the upgrade of existing infrastructure including the 11kV line from the Site towards Raglan. The refurbishment will require the upgrade of these lines to 66kV (see **Figure 6**) and associated upgrades to the relevant poles.

The report has however failed to detail the size or design of these power poles. It is however noted on page 6 of the EIS that the poles will be limited to 18m in height, due to the obstacle limitation surface associated with the airport. Considering the size and scale of the transmission lines currently running on Old Bathurst Road, the refurbishment of these poles to 66kV containing poles of a height of 18m would have a significant visual impact that has not been represented or considered in the visual analysis undertaken.



Source: Energy NGH 2022

Figure 6 Extract from Transmission Line Augmentation Works

The infrastructure associated with the panels has not been considered in the assessment (see **Figure 7**). The part of the development that will provide the greatest visual impact on the entrance into Bathurst will not be the solar farm itself but the upgraded powerlines. The failure to assess the infrastructure means the DPE does not have sufficient material to assess the impact the development will have on the scenic quality and landscape character and cannot approve the development in accordance with SEPP TI and s4.15(1)(b) of the *Environmental Planning and Assessment Act 1979 (EP&A Act)*.



Source: Iris 2022

Figure 7 Extract of Photomontage - Short Term

Misleading information – Associated Infrastructure

The proposal has avoided detailed evaluation of the infrastructure being delivered associated with the solar farm or specifics of the proposed Voluntary Planning Agreement (**VPA**).

- **Associated Infrastructure**

The proposal has outlined that the supporting infrastructure will be delivered by Endeavour Energy, which is subject to its own approval process. This includes the substation and the electricity lines that are intended to be delivered under Part 5 of the EP&A Act. The delivery of this infrastructure is intrinsically linked to the proposal, in that it would be required if the proposal did not proceed. Some of the greatest and longest term impacts associated with the project will result from the associated infrastructure. As stated previously in this submission, the decommissioning of the project will not include the powerlines, substation, underground lines or the BESS. The impact this infrastructure has on the land will continue to restrict what can occur on the land and directly surrounding area.

Much of this infrastructure and surrounding area will be encumbered by an easement. Furthermore, land in proximity of this infrastructure and in proximity of the relevant encumbrance also affects any development application over the land. In accordance with clause 2.48 of the SEPP



TI a development application that includes the following is required to be referred to the electricity supply authority:

- Penetration of ground within 2m of an underground electricity power line or an electricity distribution pole or within 10m of any part of an electricity tower
- Development carried out
 - Within or immediately adjacent to an easement for electricity purposes (whether or not the electricity infrastructure exists), or
 - Immediately adjacent to an electricity substation, or
 - Within 5m of an exposed overhead electricity power line,
- Installation of a swimming pool any part of which is
 - Within 30m of a structure supporting an overhead electricity transmission line, measured horizontally from the top of the pool to the bottom of the structure at ground level, or
 - Within 5m of an overhead electricity power line, measured vertically upwards from the top of the pool.
- Development involving or requiring the placement of power lines underground, unless an agreement with respect to the placement underground of power line is in force between the electricity supply authority and the council for the land concerned.

The impacts of the infrastructure associated with the proposal have been considered in how they will impact the existing condition of the Site and surrounding lands, but not considered the long term effect this infrastructure will have on constraining future development of the land. It is our understanding that the upgrade of existing Essential Energy Infrastructure being operated at 11kV to 66kV would potentially require an increase in the land being affected/encumbered from 15-20m to a 30m wide corridor. Additional restrictions will be applied to land in the vicinity of the substation, BESS and underground cabling. Once this infrastructure has been upgraded and installed, the infrastructure, easements and land affected are unlikely to be relinquished by the provider, even after the solar farm has been decommissioned. The long term impact of this development is that it will ultimately restrict what can occur on the land surrounding this infrastructure in the long term.

• **Voluntary Planning Agreement**

Section 3.5.1 and 3.5.3 of the EIS outlines the intention to enter into a VPA with Council for a “benefits sharing scheme”. This includes \$18,000 per annum for the life of the project. No letter of offer has been provided and given this, DPE has no power to ensure that the Applicant actually enters the VPA with Council.



Conclusion

The Objects of the EP&A Act include the promotion of the “orderly and economic use and development of the land”. When considering the scale of the project (128,000 solar panels and associated infrastructure over 158.6ha of land) in the context of strategically located land between the Main Western Train Line, Great Western Highway and in the vicinity of the Bathurst Airport it is apparent that committing the land to energy infrastructure of this size is not an orderly and economic use of the land.

In evaluating the suitability of the Site for the development (in accordance with 4.15(1)(c) of the EP&A Act, clause 2.42 of the SEPP TI requires the future capacity for the growth of Bathurst to be considered in the assessment. Although the application has considered the strategic planning context, it has failed to recognise that the life of the project far exceeds the horizon of these strategic plans. The application also fails to recognise that although the solar panels could be decommissioned, the associated infrastructure and the restrictions that come with it will remain indefinitely. We would suggest that the additional considerations/controls for certain Regional Cities (including Bathurst) in the SEPP TI in conjunction with the development of REZs is in recognition that although large scale renewable energy infrastructure needs to be encouraged, it should not be encouraged in areas that could potentially construct the logical long term growth of regional centres.

To first determine if the scale of the proposal is suitable, the full impact of the proposal needs to be considered, including the additional land that would be impacted by the associated infrastructure, including line upgrades, substations and the BESS. The scale should ensure that the proposal and any associated infrastructure would not impact the growth and development of this strategically important land for urban purposes in the long term (beyond the planning horizons in the LSPS and Regional Plan).

We consider all the above issues are important and critical. Accordingly, we would expect that until such time as the issues discussed above have been addressed, DPE cannot approve the development.

Should you have any questions regarding matters in this letter please do not hesitate to contact myself or Michael Hanisch (0403 239 230).

Yours faithfully

GLN PLANNING PTY LTD

**PAUL GRECH
DIRECTOR**

14 December 2022

HWL Ebsworth Lawyers
Level 14, Australia Square
264-278 George Street
Sydney NSW 2000

Attention: Paul Lalich – Partner

Dear Paul,

Re: Review of Environmental Impact Statement (EIS) for the proposed Glanmire Solar Farm, Lot 141 on DP1144786, Glanmire, New South Wales

Thank you for instructing Gilbert & Sutherland Pty Ltd (G&S) to review the Environmental Impact Statement (EIS) dated November 2022 and prepared by NGH Pty Ltd (NGH) for the proposed Glanmire Solar Farm at 4823 Great Western Highway, Glanmire, New South Wales. In reviewing the adequacy of the EIS, this letter focusses on the agriscience and land-use conflict aspects of the proposed development.

Background and Scope of Review

In August 2022, G&S provided an initial review of the May 2021 SLR Consulting Report titled '*Land & Soil Capability Assessment*' (LSCA) on behalf of Elgin Energy Pty Ltd (Elgin Energy). Our initial August 2022 advice is included as Attachment 1 for ease of reference. In October 2022 Elgin Energy, submitted an EIS for the proposed solar farm development on land described as Lot 141 DP1144786 at 4832 Great Western Highway, Glanmire (herein referred to as 'the site'). G&S was tasked with reviewing the EIS with respect to agriscience and land-use conflict.

Our review considered information downloaded from the NSW Government Major Projects website, including:

- SLR Pty Ltd's 'Agricultural Impact Assessment, Glanmire Solar Farm', original reference 630.30108.001, dated September 2022 ('the AIA'); and
- SLR Pty Ltd's 'Land and Soil Capability Assessment, Glanmire Solar Farm' dated September 2022 ('the LSCA').

Robina

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Agriculture. Water. Environment.

Agriscience and Land-use Conflicts

The AIA was prepared by SLR to assess the impacts of the Project on agricultural industries within the proposed footprint of the development, and surrounding lands. The AIA included a Biophysical Strategic Agricultural Land (BSAL) Verification assessment, in addition to a Land & Soil Capability (LSC) assessment and an Agricultural Productivity Gross Margin Sensitivity Analysis. Our review of the documentation indicates that:

- The Site is located within the RU1 Primary Production zone under the Bathurst Regional Local Environmental Plan 2014 (LEP), and the surrounding land use is agricultural land. The LEP references and acknowledges electricity generating works are regulated by the *State Environmental Planning Policy (Transport and Infrastructure) 2021* (SEPP). In accordance with the SEPP, the proposed solar farm is permissible with consent on Primary Production land zoned RU1.
- It is unlikely that the development would result in permanent alienation of agricultural land during its operation. Grazing on the site can occur concurrently with the proposed development, as it is a compatible land use. The solar farm is projected to have a project life span of approximately 40 years, with minimal impact on the overall agricultural capability of the soil. Assuming a 40-year span of operation and remediation of the site afterwards, the proposal represents a temporary use, meaning that the long-term productivity of the lands resources would be maintained. However, as we understand it, there is no detail provided of a security deposit or a bank guarantee to cover remediation costs at the end of the proposed land use.
- The AIA describes that upon decommissioning, the site would be in a similar or better condition than it was pre-development due to the benefits that will result from operational management procedures to protect groundcover. Increased groundcover on the rested land within the solar farm development would see the soil organic matter increase during the design life of the development. Such an increase would be expected to increase the soils' rainfall infiltration and moisture holding capacity. The elevated moisture holding capacity will minimise runoff and subsequent erosion.
- Managed grazing to maintain the groundcover during operations is proposed. The site will continue with stock grazing (sheep) and will be grassed underneath the panels. Properly maintained groundcover resulting from the panels and stock grazing will encourage growth of perennial grasses and will increase soil stability of the grassland and the moisture and nutrient holding capacity whilst decreasing runoff from the site.
- The AIA included results from fieldwork undertaken to verify the presence or absence of BSAL on the site. The soil sampling regime was designed to meet the requirements of the *Interim protocol for site verification and mapping and biophysical strategic agricultural land* (BSAL Verification Protocol). The results of the BSAL verification also informed the land and soil capability assessment.

Our August 2022 advice letter reviewed the May 2021 version of the LSCA. SLR's

September 2022 AIA included an updated version of the LSCA dated October 2022. However, upon review of the October 2022 LSCA report, it is confirmed that the assessment methodology and findings are consistent with that of the previous May 2021 LSCA. On that basis, our 31 August 2022 comments remain unchanged and are included again below.

The SLR Report applied an adequate detailed borehole sampling intensity and analysis for the site. However, in our view, the observation/check sites are substantially fewer in number than ought to have been employed.

Additionally, the spatial distribution of the detailed and check sampling points appeared to have been partially or fully determined by ease of accessibility (e.g. proximity to access roads/tracks) and, as such, may not accurately reflect all of the site conditions/soil types.

A more accurate assessment of the sites soil characteristics should be undertaken, in our view. This would include further and/or supplementary sampling across a range of slopes and elevations within paddock areas, away from disturbed sites such as access roads and dams. We would recommend that such sampling include the 46 observation sites, together with at least another six detailed boreholes in appropriate locations as described above.

At each detailed borehole location, soil samples should be retrieved from the boreholes at each major soil horizon and sent for laboratory analysis for an agricultural suite of parameters. All new borehole logs should include the location coordinates, with the coordinates of the existing detailed and check locations also supplied.

The LSCA prepared by SLR is not adequate in terms of methodology or soil site selection. As described above, the borehole intensity and spatial distribution are insufficient, and definitive LSC classes cannot be identified based on this extent of sampling. In this case, the NSW Government SEED portal identifies Class 3 (high capability land) and Class 5 (moderate-low capability land) on the site, whereas the low intensity sampling undertaken by SLR seeks to downgrade this classification to Class 4 and Class 5 land.

The NSW Department of Planning and Environment (DPE) *Large-Scale Solar Energy Guidelines*, August 2022 (2022 Guidelines) provides guidance on agricultural land assessments, in particular soil surveys, which should be undertaken in accordance with the *Guidelines for Surveying Soil and Land Resources (Second Edition) 2008*, McKenzie et al (*Guidelines for Surveying Soil and Land Resources*). The 2022 Guidelines recommend that soil surveys should be completed at an inspection density of 1 site per 5 to 25 ha. If this rate is applied to this site, 8 to 38 soil survey locations would be required. The LSCA prepared by SLR included 6 detailed and 8 check sites, aligning with the lower end of this range. Given that the sampling yielded a soil classification that differs from the NSW Government classification, it is our view that additional sampling should be undertaken to confirm the appropriate Land Class as this will impact the ultimate end of

use rehabilitation requirements for the Project.

Summary

Our review considered information from the NSW Major Projects website, supplemented by information you provided, our own limited enquiries and our discussions.

The solar farm is considered a temporary land use and is not likely to permanently impact the land's productivity or soil capability. Managed appropriately, agricultural activities such as limited grazing (sheep) can occur concurrently with the solar farm project.

In the absence of an adequate land and soil capability assessment, a precautionary approach is recommended by applying the NSW Government SEED portal land and soil capability classification. The Site is mapped as Class 3 (high capability land) and Class 5 (moderate-low capability land) under the SEED mapping. Class 3 is considered important agricultural land and requires a Level 3 assessment (detailed) in terms of site selection for a solar farm.

A detailed soil survey should be undertaken that meets the minimum requirements outlined in the Guidelines for Surveying Soil and Land Resources and as identified in the 2022 Guidelines.

We trust this advice is of assistance. Please do not hesitate to contact us should you require any further details or elaboration.

Yours sincerely,



Phil Matthew
Principal Agricultural Scientist
BAgSc DURP MResSc PhD MAIAST



Sarah Cantwell
Senior Environmental Scientist
BEnvMgt

Authors Sarah Cantwell and Phil Matthew

Our Reference 12173_ADV091222 PLM2F.docx

Your Reference

By ☐ Courier ☒ Email ☐ Facsimile ☐ Post

Enclosures – 1 (31 August 2022 advice)

Attachment 1 – 31 August 2022 advice

31 August 2022

HLW Ebsworth Lawyers
Level 14, Australia Square
264-278 George Street
Sydney NSW 2000

Attention: Andrew Scully – Senior Associate

Dear Andrew,

Re: Bathurst Solar Farm, 4823 Great Western Highway, Glanmire, New South Wales

Thank you for instructing Gilbert & Sutherland Pty Ltd (G&S) to review the May 2021 SLR Consulting Report entitled '*Land & Soil Capability Assessment*' (herein referred to as the SLR Report). The SLR Report was prepared for the proposed Bathurst Solar Farm located at 4823 Great Western Highway, Glanmire, New South Wales (formally described as Lot 141 DP1144786 and herein referred to as 'the site'). A site location is provided in Attachment 1 (Drawing 12173_001).

Background

Elgin Energy (Elgin) has proposed to develop a solar farm at 4823 Great Western Highway, Glanmire, New South Wales, approximately 11 kilometres east of the city of Bathurst. The site has a total area of 186 hectares (ha), of which the development footprint would occupy 140 ha. Elgin commissioned SLR Consulting to complete a land and soil capability (LSC) assessment for the proposed development, resulting in the aforementioned SLR Report.

Soil survey

SLR undertook a field investigation during November 2020. With respect to the soil survey, the SLR Report stated:

'The soil survey was originally designed to meet the requirements for BSAL Verification and the Interim Protocol, a risk assessment was undertaken to determine the required survey density. The Interim Protocol states "the proponent should undertake a risk assessment as this will influence the density of soil

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sampling require as explained in Section 9.6.1. The proposed activity on parts or all of the project area may be of low risk to agriculture and so may only require a sampling density of 1:100,000. Alternatively other areas may be at higher risk of impact and so should have a sampling density of 1:25,000".'

(SLR Report, page 12)

The subsequent risk assessment by SLR determined the activity to be a low risk (B5), concluding that the study area required an inspection density of 1:100,000.

A total of 14 sites (comprising 6 detailed and 8 check sites) were evaluated. Checks sites are mapping observations examined in sufficient detail to allocate the site to a specific soil type and map unit. For detailed sites, soil was collected from each major soil horizon, with select samples sent for laboratory analysis.

Using a combination of the soil survey and the laboratory analysis results, the site soils were classified predominantly as Sodosols in accordance with the Australian Soil Classification, with one location (BS5) classified as a Chromosol. Based on the soil characterisation and laboratory analysis for detailed sites 1 to 6, the LSC concluded that the site is predominantly LSC Class 4 (i.e. moderate capability land).

G&S assessment

Sampling intensity

The SLR Report's land capability methodology and results were reviewed. As noted, the scope of the soil survey was designed to meet the requirements of the BSAL interim verification protocol. The number of detailed boreholes required under this method was not dissimilar to the number of boreholes that G&S would recommend, and accorded with the recommended minimum for a 'high' intensity survey (one observation per four ha) outlined in the Soil and Land Survey Handbook (CSIRO, 2009).¹ However, the number of observation sites (referred to as 'check sites' in the SLR Report) was far fewer than what would be recommended.

Given the site's area (186 ha), a site soil sampling regime should include approximately 46 observations, with a minimum of 10% of these subject to detailed soil profile descriptions (5 boreholes), to yield adequate data for minor soil profile classification.

Slope assessment and soil locations

In order to aid our review, a slope assessment was prepared and is included as Drawing 12173_005 in Attachment 1. As borehole/check site coordinates were not provided in the SLR Report, the slope assessment used approximate locations for the detailed boreholes

¹The National Committee on Soil and Terrain 2009 'Australian Soil and Land Survey Handbook (3rd Edition)' CSIRO Publishing Collingwood Victoria. (note: an updated version of the McDonald, R.C., Isabell, R.F., Speight, J.G., Walker, J. and Hopkins, M.S., 1990, 'Australian Soil and Land Survey Field Handbook (2nd Edition)'. Inkata Press, Melbourne.

and the check sites. As shown, the predominant site slopes range from 0 to 10%. The slope and dominant topography for each detailed borehole location is provided in Table 1.

Table 1 Slope and topography for six detailed soil sites (SLR Report)

Detailed site	Slope (%)	Dominant topography
BS1	19	Lower slope
BS3	1	Lower slope
BS4	1	Lower slope
BS5	1	Mid slope
BS6	1	Upper slope

The majority of detailed soil sites (B3-B6) were located on near-level ground (1%), with only BS1 located within the 10-20% slope range (19%). For soils mapping purposes, a spatial distribution of soil sampling locations across a site, capturing a range of slope classes, is generally recommended. Confirmation of the borehole locations (i.e. provision of coordinates) would aid in understanding the slope classes within which they were located. However, in the absence of that information, the locations of the detailed soil boreholes within the SLR Report may not accurately represent all of the site conditions.

In addition to the detailed sites, eight check sites were included in the assessment. The following comments are made regarding the check sites:

- Check site 1 was located on the edge of a constructed dam wall, meaning soils at this location were likely to be highly disturbed with a mixture of horizons, rather than representative of the soil profile in the underlying undisturbed soils.
- Check site 2 depicted an eroded surface near a gate access point, which was therefore likely to have been influenced by rainfall events and trafficking.
- Check sites 3 to 6 were also located on separate constructed dam walls, similar to check site 1. Therefore the soil at each of these locations is also likely to be highly disturbed and potentially composed of a mixture of soil horizons.
- Check sites 7 and 8 appeared to be surface flow areas that were mildly eroded, and likely to have been indicative of soil deposited during rain events. The description of Check site 8 noted that the area was a stock laneway, and therefore also likely to be highly disturbed and compacted.

Conclusions and recommendations

The SLR Report applied an adequate detailed borehole sampling intensity and analysis for the site. However, in our view, the observation/check sites are substantially fewer in number than ought to have been employed.

Additionally, the spatial distribution of the detailed and check sampling points appeared to have been partially or fully determined by ease of accessibility (e.g. proximity to access

roads/tracks) and, as such, may not accurately reflect all of the site conditions/soil types.

A more accurate assessment of the site soils' characteristics should be undertaken, in our view. This would include further and/or supplementary sampling across a range of slopes and elevations within paddock areas, away from disturbed sites such as access roads and dams. We would recommend that such sampling include the 46 observation sites, together with at least another six detailed boreholes in appropriate locations as described above.


At each detailed borehole location, soil samples should be retrieved from the boreholes at each major soil horizon and sent for laboratory analysis for an agricultural suite. All new borehole logs should include the location coordinates, with the coordinates of the existing detailed and check locations also supplied.

We trust that this information is of assistance. Please do not hesitate to contact this office if you require any further details or elaboration.

Yours sincerely,



Greg Holland
Director/Principal Environmental Scientist
BSc AES Grad Dip SusLanMan



Sarah McGhee
Environmental Scientist
BEnvMgt

Authors Greg Holland & Sarah McGee

Our Reference 12173_ADV_SAM1F.docx

Your Reference

By ☐ Courier ☒ Email ☐ Facsimile ☐ Post

Enclosures 1 (Drawings)

Attachment 1 – Drawings



ORIENTATION
SCALE

0 100 200 300 400 500 metres

ROBINA
07 5578 9944
Enquiries@ccccc.com.au

LEGEND

Lot boundaries

SOURCES

Neamap Image
Image source: 28 June 2022
Image dates: NSW Government Spatial Service
Cadastral:

PROJECT

12173 - BATHURST
SOLAR FARM MATTER
[HWLE- MATTER,
CO187470.1002900]

CLIENT

HWL Ebsworth
Lawyers

DRAWING

SITE LOCATION

PROJECT

12173

CHECKED

NMS

DRAWN

DKK

DATE

11/08/2022

SCALE

1:12,500@A3

REVISION

000

+GILBERT
SUTHERLAND

15 December 2022

HWL Ebsworth Lawyers
Level 14, Australia Square
264-278 George Street
Sydney NSW 2000

Attention: Paul Lalich – Partner

Dear Paul,

**Re: Review of Environmental Impact Statement (hydrological impacts), proposed
Glanmire Solar Farm, Lot 141 on DP1144786, Glanmire, New South Wales**

Thank you for instructing Gilbert & Sutherland Pty Ltd (G&S) to review NGH Pty Ltd's Environmental Impact Statement (EIS) – Glanmire Solar Farm, dated November 2022 for the proposed Solar Farm at 4823 Great Western Highway, Glanmire, New South Wales. In reviewing the adequacy of the EIS, this letter focusses on the hydrological impacts of the proposed development.

Scope of review

G&S was tasked with reviewing the EIS with respect to hydrological impacts. Our review considered information downloaded from the NSW Government Major Projects website, including:

- The EIS; and
- Footprint NSW Pty Ltd's 'Hydrological and Hydraulic Analysis, Proposed Glanmire Solar Farm, Glanmire, New South Wales', original reference project no. 2179, dated 8 September 2022 ('the HHA').

Our review findings below address the hydrological impacts of the development in four parts – surface water, groundwater, flooding and erosion.

Hydrological impacts

The HHA was reviewed to assess any potential hydrological impacts that may result from the proposed development. The main factors within our areas of expertise that may be affected by the construction and operation of solar farm infrastructure include surface water, groundwater, flood behaviour and soil erosion.

Surface water

The proposed solar farm would result in a substantial change in land surface cover and this may affect both the timing and total volume of surface water infiltration into the soil following rainfall events. Due to the significant reduction of both water shedding behaviour and surface roughness (due to the change from grassed surface to the glass/plastic coated surface of the solar panels), the amount and velocity of overland flow (i.e. runoff) across the site is expected to increase. This has the potential to increase the volume of surface water discharging from the site, thus reducing the volume available to infiltrate the land surface and replenish the soil store.

In addition, the nature of the development would lead to concentration of flows within the site especially at the discharge end of the panels and the panel arrays. This concentration of flows would require a stormwater collection and dispersal plan to minimise the risk of soil erosion on site and the discharge of sediment off site to the neighbouring properties and the natural and anthropogenic drainage systems off site.

Given the nature of solar farm construction, in which the ground-mounted photovoltaic panels are elevated above the land surface to a level above the height of the predicted 1% Annual Exceedance Probability (AEP) plus 500 mm freeboard (FSE 2022:16), the existing surface cover dominated by grass pasture would not be altered. Approximately 4% of the soil surface would be disturbed by the construction of the solar infrastructure. The proponent notes that, following the post construction remediation stage, more than 90% of the land within the proposed development's footprint will suffer no permanent disturbance.

It is worthy to note that although the final product may disturb 4%, the construction phase requires the use of machines and labour which will disturb the soil surface and lead to reduced cover and soil compaction. The construction itself may lead to some soil surface structure decline which would require remediation.

Furthermore, the calculation of the 4% figure itself is unclear. It may be limited to finished roads, the building infrastructure and the impact zone of the piles holding the panels. If this figure only accounts for the site condition post-construction (i.e. during the operational phase), it may not represent the full extent of areas disturbed during the construction phase. For instance, should a higher AEP event occurs during the construction phase, the erosion risk would increase. There may also be a need for further mitigation measures such as drainage infrastructure, or surface stabilisation efforts to mitigate against the shelter impacts of the panels themselves. Given that additional mitigation measures would likely be required below and between panels (e.g., provision of erosion and sediment control devices which comply with IECA (2008) Guidelines), these would likely increase the overall site disturbance figure. Clarification of this total site disturbance figure is required.

A Groundcover Management Plan (GMP), proposed to be developed with an agronomist, should include establishment and maintenance of perennial grass cover

across the site post construction and during the operational phase. This would ensure that the land surface cover of the site would be maintained and easily restored to its pre-existing condition, once the solar farm is decommissioned. The impacts on stormwater during the construction and operational phases may be mitigated to some extent by retaining as much groundcover as possible, remediating traffic areas and developing a soil and water management plan to minimise erosion.

Development activities (i.e., soil excavation for roads, drainage, parking areas, building footings, trenching (for underground cable installation), waterway construction and hardstand areas) are to be subject to construction phase management procedures for water quality and quantity within the site. Whilst the management procedures are expected to provide suitable mitigation of impacts, additional erosion control measures are necessary in our view (see 'Erosion' below).

HEC-RAS, DRAINS and RAFTS software were used to simulate hydrologic and hydraulic models with rainfall depth data input obtained from Bureau of Meteorology rainfall IFD data (NGH, 2022:1,5,6). In the post-development model, the floodplain's surface roughness was anticipated to slightly increase as a result of the proposed development, resulting in additional flow resistance on the ground, or in other words a lower velocity of water flow.

Significant impacts on flood behaviour for the 1% AEP event due to the proposed development are unlikely, with flood level, depths, velocities and hazards remaining largely unchanged. The resulting flow velocities in the post-development scenario indicate that it may be unlikely that adverse impacts to the bed and bank stability of waterways during the 1% AEP flood event would occur.

With regard to surface water flow (generally ephemeral flow) within the site through existing waterways, flow would not be altered except during construction of the internal roads and underground cables installation. Based on the HHA, the local hydrological patterns within the site would be maintained. With the exception of catastrophic events such as fires or large scale accidents or breakdowns of the facilities, minimal impacts to surface water quality are likely to occur during the operational phase as suitable drainage features will be constructed along internal roads. The drainage features will minimise the risk of polluted water leaving the site or entering the waterways. Improved water quality onsite is suggested through remediation strategies defined in the Agricultural Impact Assessment and revegetation of eroded riparian areas.

In relation to runoff management, the EIS endorses the benefit of shading associated with the solar panels, which is well established in literature. Studies confirm that a spatially uniform shadow pattern created under solar panels would foster uniform

biomass accumulation due to increased soil moisture¹ which ultimately would reduce runoff.² This potential effect may, to some extent, offset the earlier identified potential effect of less infiltration on the site.

Similarly, the post development case would result in concentration of flows in the area below the solar panels due to the change from a grassed surface to solar panels causing increased water draining from the panels and significantly increased peak discharge.³ The EIS proposes to offset this effect by revegetation of two streams within the site with riparian vegetation as well as planting trees around the perimeter of the site. However, the proposed GMP, Soil and Water Management Plan (SWMP), and Erosion and Sediment Control Plan (ESCP) make no mention of erosion control measures underneath the solar panel arrays, nor specific maintenance measures for lands between rows of solar panels. If left unmanaged, the increased water discharge in the site would cause impacts not only within the site, but also potentially to neighbouring properties.

The change in runoff processes and characteristics caused by the glass or plastic coated surface of the solar panels was not modelled in the flood assessment. In our view, the models could benefit from amendments in which a revised flood model is produced to include the changed runoff in the developed case, and additional mitigation measures adopting stormwater management and drainage strategies in the mitigated case.

In the mitigated case, a network of erosion control structures (e.g., shallow trenches with gravel aggregates as backfilling material, laid underneath each panel) could reduce detachment and displacement of soil aggregates due to kinetic energy created from water falling from the solar panels, and therefore mitigate the impacts of increased flow velocities. Furthermore, the provision of erosion control structures which serve to diminish artificial soil tilling, prevent rill or gully erosion, and convey concentrated discharge of stormwater runoff from the panels during high intensity rainfall would decelerate and thin sheet flow due to additional surface roughness. This would further aid soil infiltration and deep percolation,⁴ helping to offset potential infiltration losses. Therefore, as part of stormwater management strategies, erosion control structures underneath panel arrays are recommended to be included in the SWMP and/or ESCP, together with the adoption in the GMP of measures to maintain the lands between rows of solar panels.

¹ Adeh EH, Selker JS & Higgins CW (2018). Remarkable agrivoltaic influence on soil moisture, micrometeorology and water-use efficiency. *PLoS ONE* 13(11): e0203256. DOI: 10.1371/journal.pone.0203256.

² Bennett RG, Mendham D, Ogden G & Bartle J (2014). Enhancing tree belt productivity through capture of short-slope runoff water. *GCB-Bioenergy* 7(5), 1107-1117. DOI: 10.1111/gcbb.12207.

³ Cook LM & McCuen RH (2013). Hydrologic Response of Solar Farms. *Journal of Hydrologic Engineering* 18(5), 536–541. DOI:10.1061/(asce)he.1943-5584.0000530.

⁴ Elamri Y, Cheviron B, Mange A, Dejean C, Liron F & Belaud G (2018). Rain concentration and sheltering effect of solar panels on cultivated plots. *Hydrology and Earth System Sciences* 22, 1285–1298. DOI: <https://doi.org/10.5194/hess-22-1285-2018>.

Without proper modelling that adequately represents the changing of the land surface with solar panels, the development's impacts on the site's hydrological regime (i.e. flood and soil erosion, and provision of appropriate stormwater management and drainage strategies) cannot properly be assessed. Similarly, incorporation of the stormwater management and drainage strategies in the mitigated case needs to be modelled to demonstrate that the proposed development would have minimal, locally confined peak discharge and/or flood impacts.

Groundwater

Any proposed development has the potential to impact groundwater resources including groundwater dependent ecosystems (GDE), adjacent licensed water users and their water access, in addition to any surrounding wetlands. The HHA was reviewed to determine whether the proposed solar farm would impact local or downstream receiving environments. It is important to note mapping for groundwater vulnerability around the site is not available (EIS, 2022:198).

Whilst there are no active bores within the site, several identified water supply bores are located nearby with the closest being approximately 131 m northwest of the site (EIS, 2022:198). However, this bore is in a catchment that is unaffected by the proposed development and is unlikely to be impacted.

No groundwater was identified in 17 test pits (depths ranging from 1.7 m to 3.2 m below ground level) constructed during preliminary geotechnical surveys (EIS, 2022:198). As groundwater interception is not expected during the construction phase (EIS, 2022:201), the local groundwater is considered non vulnerable (EIS, 2022:203).

No active groundwater sharing plans were identified for the Bathurst local government area. However, three relevant water sources were identified (i.e., Macquarie River above Burrendong Water Source; Fish River Water Source; and Winburndale Rivulet Water Source) with a total of 10,903.5 ML of entitlements as of the 2021/2022 financial year (EIS, 2022:198).

No groundwater will be extracted within the site during the construction and operation phases (EIS, 2022:202). Potable water would be sourced from both the on-site dams and rainwater collected in tanks during the construction phase.

With regards to GDEs and wetlands, there are none within the site, and the nearest GDE is located along Salt Water Creek approximately 760 m south of the site (EIS, 2022:198). Impacts on groundwater during decommissioning would be similar or less than construction (EIS, 2022:203).

As noted above, the elevated solar panels will act like a paved surface which may limit infiltration of water into the soil. However, the impact on groundwater recharge is likely to be offset by the openings created between the solar panels and ground surface. Moreover, the report states that the design will accommodate sufficient space between the panels to promote groundcover maintenance beneath the panels (EIS, 2022:192). This design, incorporating recommended erosion and sediment control measures in the

mitigated case as discussed above, would provide soil protection against erosion, while enhancing infiltration and reducing surface runoff volume.

Flooding constraints

A flood assessment analysis was completed and reported by Footprint Sustainable Engineering Pty Ltd (FSE, 2022). The extent of flood inundation across the site was simulated for 1% and 5% AEP flood events under the pre-development and post development cases (EIS, 2022:194). The extent of inundation in the pre-development case due to flood in the site is considered ephemeral and contained in all the watercourses during and shortly after rainfall events (EIS, 2022:194). The flood hazard within the site is predominantly categorised as a H1 (generally safe for vehicles, people, and buildings) (EIS, 2022:195) with the exception of the site's existing farm dams and second order watercourse.

The flooding hazard risks associated with temporary minor flooding during high rainfall events and high flows within the site have been sufficiently addressed in our view. The risks management approach is described in an Emergency Response Plan (ERP) which incorporates a Flood Response Plan (EIS, 2022:203,210,280).

Soil erosion

The potential of soil erosion impacts was reviewed in relation to increased erosion risks associated with vegetation removal (EIS, 2022, 186). Whilst the potential increase of soil erosion due to soil disturbance during construction is indicated, it is considered manageable (EIS, 2022:178,182) and it is likely the standard erosion and sediment control measures used in normal construction practice will be sufficient. The post-development erosion risk is proposed to be managed in accordance with measures detailed in the SWMP and ESCP. Additionally, a Rehabilitation Plan has been developed to restore the site to its pre-existing condition following decommissioning.

While the EIS suggests that the risk of erosion within the site during the construction and operational phases is manageable, the proponent has not provided an appropriate flood model that represents and assesses the impact of changing the land surface with solar panels, and includes the effects of stormwater management and drainage strategies. As such, the hydrological impacts (i.e., flood and soil erosion) of the development within the site and to the neighbouring properties requires further assessment. Stormwater management strategies (as discussed above) should be modelled to ensure that the concentrated discharge of stormwater runoff is managed and soil erosion underneath the panels is minimised.

Conclusions regarding hydrological impacts

The potential impacts on surface water, groundwater, flood behaviour and soil erosion arising from the proposed development are as follows.

1. The change in site cover (from pastures to panels) will alter surface water and runoff behaviours (i.e., volumes, infiltration, and peak flows). The flood model in the EIS

does not adequately represent and assess this change, nor does it represent and assess the stormwater management and/or erosion control measures and drainage that will likely be required during the construction and operational phases. This means that the hydrological impacts of the development, both within the site and on the neighbouring properties, have not been fully assessed.

2. A revised flood model is required that represents and assesses changes in runoff due to the change of soil surface to solar panels in the developed case, and additional mitigation measures adopting stormwater management and drainage strategies in the mitigated case. Whilst those effects may offset each other, to the extent that net effects might be considered minor, the revised modelling is necessary to determine whether the solar farm development would deleteriously alter the site's hydrological regime.
3. Groundwater recharge is likely to be unaffected and groundwater impacts within and beyond the site are considered unlikely.
4. Inundation extents in the post-development case are to be ephemeral and contained in the watercourses during and shortly after rainfall events. Areas susceptible to flood have been identified and evaluated, with the risks and impacts appropriately addressed to an extent that they are manageable.
5. Whilst erosion risks as a result of activities during the construction and operation phases within the site are reportedly manageable in the current flood model, additional mitigation measures during the construction phase are required to minimise impacts on the site and adjacent properties, particularly if a higher AEP flood event were to occur during site disturbance activities.
6. The proposed GMP, SWMP and ESCP should incorporate additional stormwater management strategies (i.e. ESC measures under panels and specific maintenance of lands between panel rows). Such hydrologic and hydraulic measures would serve as a buffer strip for energy dissipation, reducing the detachment and displacement of soil aggregates, reducing flow velocities and increasing infiltration.

Summary

Our review considered what we identified as the latest information from the NSW Major Projects website, supplemented by information you provided, our own limited enquiries and our discussions.

Deficiencies in the information supporting the development application with respect of hydrological impacts were identified. Specifically, the issues related to the risk of increased concentrated discharge of stormwater runoff from the solar panels and increased soil erosion underneath the panels requires further assessment.

Based on the modelling and reporting in the EIS, the hydrological regime disturbance to the development site and downstream receiving environments is yet to be fully assessed. Whether the impacts are minimal or otherwise has not yet been demonstrated. In any case, the adoption of further site-specific measures supported by appropriate monitoring

is recommended.

We trust this advice is of assistance. Please do not hesitate to contact us should you require any further details or elaboration.

Yours sincerely,



Dua Klaas
Principal Engineer
BEng(Hons) MSc MEngSc(RES) PhD



Phil Matthew
Principal Agricultural Scientist
BAgSc DURP MResSc PhD MAIAST

Authors Dua Klaas

Our Reference 12173 ADV1_PLM2F.docx

Your Reference

By ☐ Courier ☒ Email ☐ Facsimile ☐ Post

Enclosures - Nil

References

- Ball J, Babister M, Nathan R, Weeks W, Weinmann E, Retallick M & Testoni I, (2019). Australian Rainfall and Runoff: A Guide to Flood Estimation, Book 6 Flood Hydraulic. Commonwealth of Australia, Geoscience Australia.
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- IECA (2008). Best Practice Erosion & Sediment Control. International Erosion Control Association, Australasia.

urbaine design group

Review of Visual Impact Assessment, forming part of the environmental Impact Statement for Development Application Number SSD-21208499.

CONTENTS:

1. INTRODUCTION
2. THE SITE:
3. THE RELEVANT PLANNING CONTROLS:
4. THE VISUAL IMPACT ASSESSMENT
5. VISUAL IMPACT ASSESSMENT - METHODOLOGY:
6. URBAINES REVIEW OF IRIS VISUAL IMPACT ASSESSMENT
7. GLARE
8. MITIGATION.
9. CONCLUSION
10. APPENDIX A: Aspinall CV and Methodology article – Planning Australia, by Urbaine Architectural.

1. INTRODUCTION:

I, John Robert Aspinall, have been engaged by HWL Ebsworth, to review the Visual Impact Assessment, forming part of the environmental Impact Statement for Development Application Number SSD-21208499 (being a State Significant Development).

I am a UK qualified architect (and have over 20 years' experience in the field of photomontage creations and Visual Impact Assessment. As an Expert Witness in this field, I am bound by the Schedule 7 Expert Witness Code of Conduct, contained within the Uniform Civil Procedure Rules 2005.

2. THE SITE:

For a clear understanding of the context of the Subject Proposal, a series of extractions below, have been taken from the EIS and accompanying documents below. These are referred to within the Urbaine Assessment:

The Subject land on which the Subject Proposal is to be located is Lot 141 DP1144786, in Glanmire, NSW. The site is located approximately 10km east of the centre of Bathurst and has the following characteristics:

- Zoned for rural use (RU1) with surrounding land uses predominantly agricultural.
- Bounded to the north by the Great Western Highway; the eastern 'gateway' to Bathurst.
- Generally low relief terrain compatible to construction and solar panel orientation to optimise solar yield and 66kV infrastructure (currently operated at 11kV) located adjacent to the site's northern boundary to connect the Project to the grid.
- Few residences with views toward the site.
- Predominantly non-native 'exotic' pasture with several isolated native trees and a linear pine planting.
- Two larger (second order) waterways and part of the Bathurst drinking water catchment.
- Two Aboriginal sites identified in field surveys; a single quartz flake in disturbed ploughed location and a culturally modified Yellow Box tree.
- A local heritage item 'Woodside' (item I142 under the Bathurst Local Environmental Plan, located at the north of the site.

The Proposal include the construction, operation and eventual decommissioning of a solar farm that would be connected into the electricity grid. Its operational capacity would be approximately 60MW AC (77DC).

A ground mounted solar photovoltaic single portrait solar array on a single-axis tracking system with:

- Approximately 128,000 solar modules.
- Row spacing between modules: Approximately 5m or greater; Clear space between panels: Approximately 2.5m or greater. Spacing may increase between rows to respond to local topography / avoid steep areas.
- Height: Limited to a maximum of 3.5m above ground level (average height of the arrays 2.5–3.0m above ground level).
- Approximately 18 inverters installed within the array area.

3. THE RELEVANT PLANNING CONTROLS:

The site is within the Central West and Orana Region and Bathurst Regional Council area. The following review identifies key documents which provide relevant planning provisions that relate to the matters considered in this assessment.

2.1.1 Central West and Orana Regional Plan 2036

2.1.2 State Environmental Planning Policy (Transport and Infrastructure) 2021

2.2.1 Vision Bathurst 2040 Bathurst Local Strategic Planning Statement, 2020

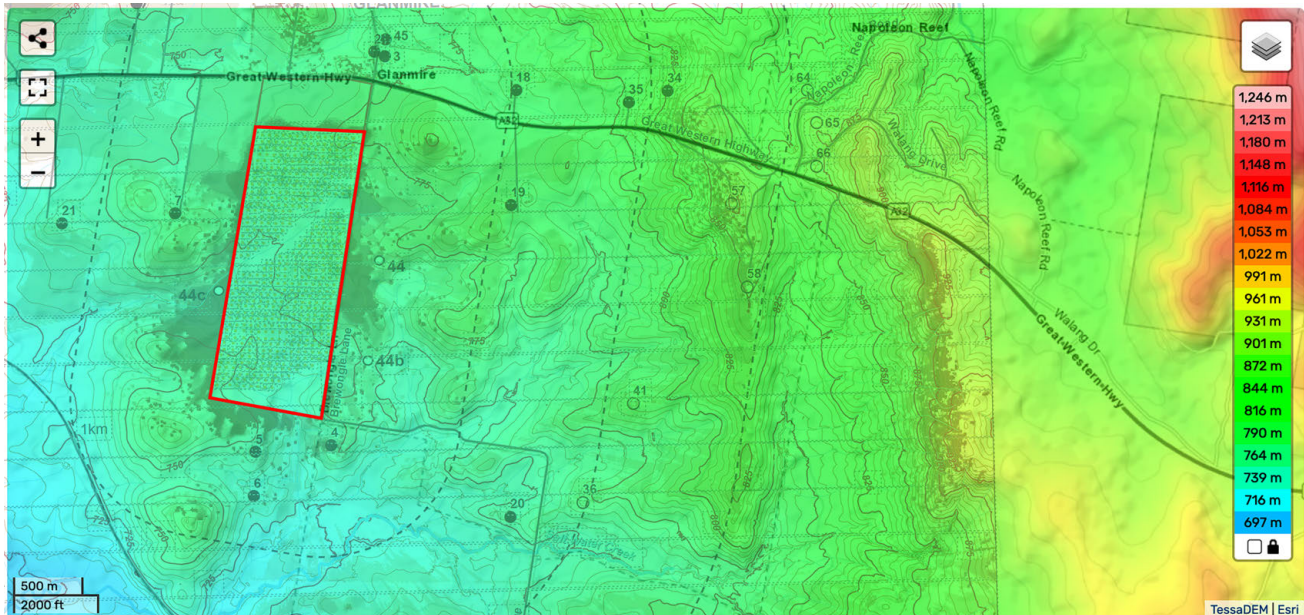
Planning Priority 12: Enhance environmentally sensitive land and biodiversity says in relation the landscape and views ... 'The Bathurst Region enjoys a range of important landscapes and vistas. The gateways into the urban areas of the city, particularly along the Great Western Highway and Mitchell Highway, have undergone new plantings under Council's Vegetation Management Plan to achieve a strong unified landscaped

environment that recognises the transition between the rural and urban landscapes with natives merging to exotics.'

- 'Improve the scenic quality of the Region by limiting urban and rural lifestyle development in areas of high biodiversity, on hilltops and ridges and provide a green edge between the urban and rural environment'

2.2.2 Bathurst Vegetation Management Plan 2019

The Bathurst Vegetation Management Plan 2019 (BVMP, Bathurst Regional Council 2019) identifies that the landscapes surrounding the city give it a sense of containment and provide a backdrop to the views from within and into the city.



4. THE VISUAL IMPACT ASSESSMENT:

In September, 2022, a Visual Impact Assessment was prepared for the development by Iris Visual Impact + Design, of 78 Macgregor Terrace, Bardon, 4065
PO BOX 189 Red Hill 4059

. This Assessment addresses Secretary's Environmental Assessment Requirements (SEARS) issued by the NSW Department of Planning, Industry and Environment (DPIE)

DPE has provided the Secretary's Environmental Assessment Requirements (SEARs) for the EIS which specifically outlines the specialist study requirements for this visual assessment.

For Visual, the SEAR is:

'Visual – including:

- a detailed assessment of the impact of the project on the scenic quality and landscape character of Bathurst Regional City, including on any approaches to the city taking into consideration any values identified by the community and Council;
- a detailed assessment of the likely visual impacts (including any glare, reflectivity and night lighting) of all components of the project (including arrays, transmission lines, substations and any other ancillary infrastructure) on surrounding residences and key locations, scenic or significant vistas, air traffic and road corridors in the public domain; and - details of measures to avoid, mitigate and/or manage potential impacts;

The Guideline for Landscape Character and Visual Impact Assessment EIA-N04, Transport for NSW, 2020 and the Guidance Note for Landscape and Visual Assessment (GNLVA), Australian Institute of Landscape Architects Queensland, 2018 provide general context for the assessment contained within this report and was used as a basis for this assessment when there was no specific guidance available for the assessment of large scale solar farms.

The Draft Large-Scale Solar Energy Guideline, prepared by the NSW Department of Planning, was put on public exhibition in December of 2021 ('Draft Guideline'), during the preparation of this assessment.

Just prior to the completion of this assessment the final Large-Scale Solar Energy Guideline (NSW DPIE, 2022) ('Final Guideline') and the accompanying Technical Supplement – Landscape and Visual Impact Assessment ('Technical Supplement') was released in August 2022. These guidelines include assessment requirements for the preparation of visual and glare impacts, and the final guideline includes guidance for landscape character assessment.

5. VISUAL IMPACT ASSESSMENT - METHODOLOGY:

This VIA, from Iris, was undertaken, utilising the recently published (August 2022) DPIE Technical Supplement - Landscape and Visual Impact Assessment Large-Scale Solar Energy Guideline

This technical supplement also aims to:

- facilitate good site selection, layout and design of solar energy projects early in the planning process
- guide the relevant identification, mitigation and management of significant impacts on the surrounding landscape and viewpoints from the private and public domain
- strengthen the landscape and visual impact assessment process to ensure consistent decision making and to reduce delays in the assessment process
- encourage the appropriate development of the large-scale solar industry in NSW.

This process is distinctly different from visual impact assessment which is solely focused on individual views. Consequently, landscape character assessment can help to understand the cumulative effect of a project on a much broader area

2.1 Baseline analysis

2.2 Identify landscape character zones

2.3 Assess the landscape character impact

3. Visual impact assessment

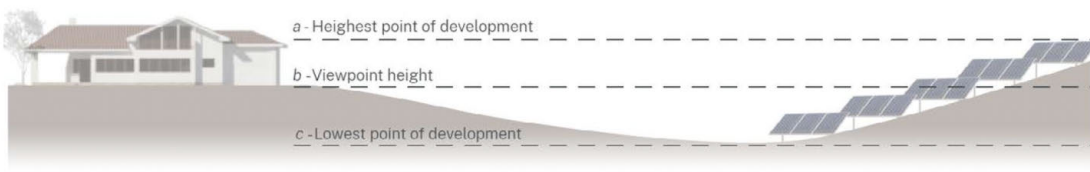
The EIS must include a visual impact assessment that considers the likely impacts of the development on viewpoints within the private and public domain. The process can be broken into two key stages – a preliminary assessment and a detailed assessment which are explained in detail throughout this section.

3.1 Preliminary assessment

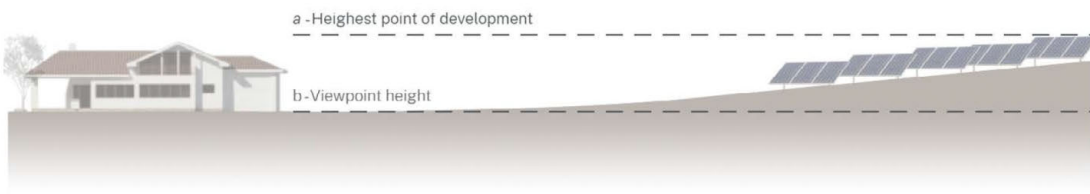
Below is a series of diagrams, indicating the relative height differences between receptors and the proposed solar arrays.

Figure 3: Calculating relative height difference

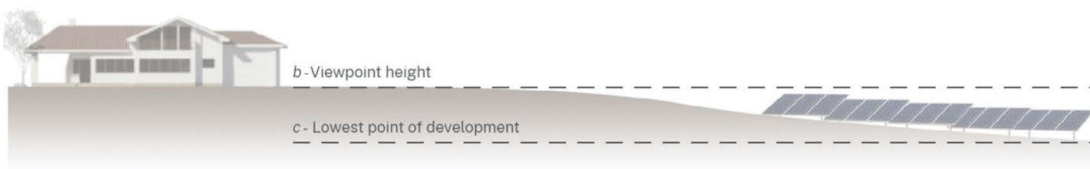
Project located above and below viewpoint (a-c)



Project located above viewpoint (a-b)



Project located below viewpoint (b-c)



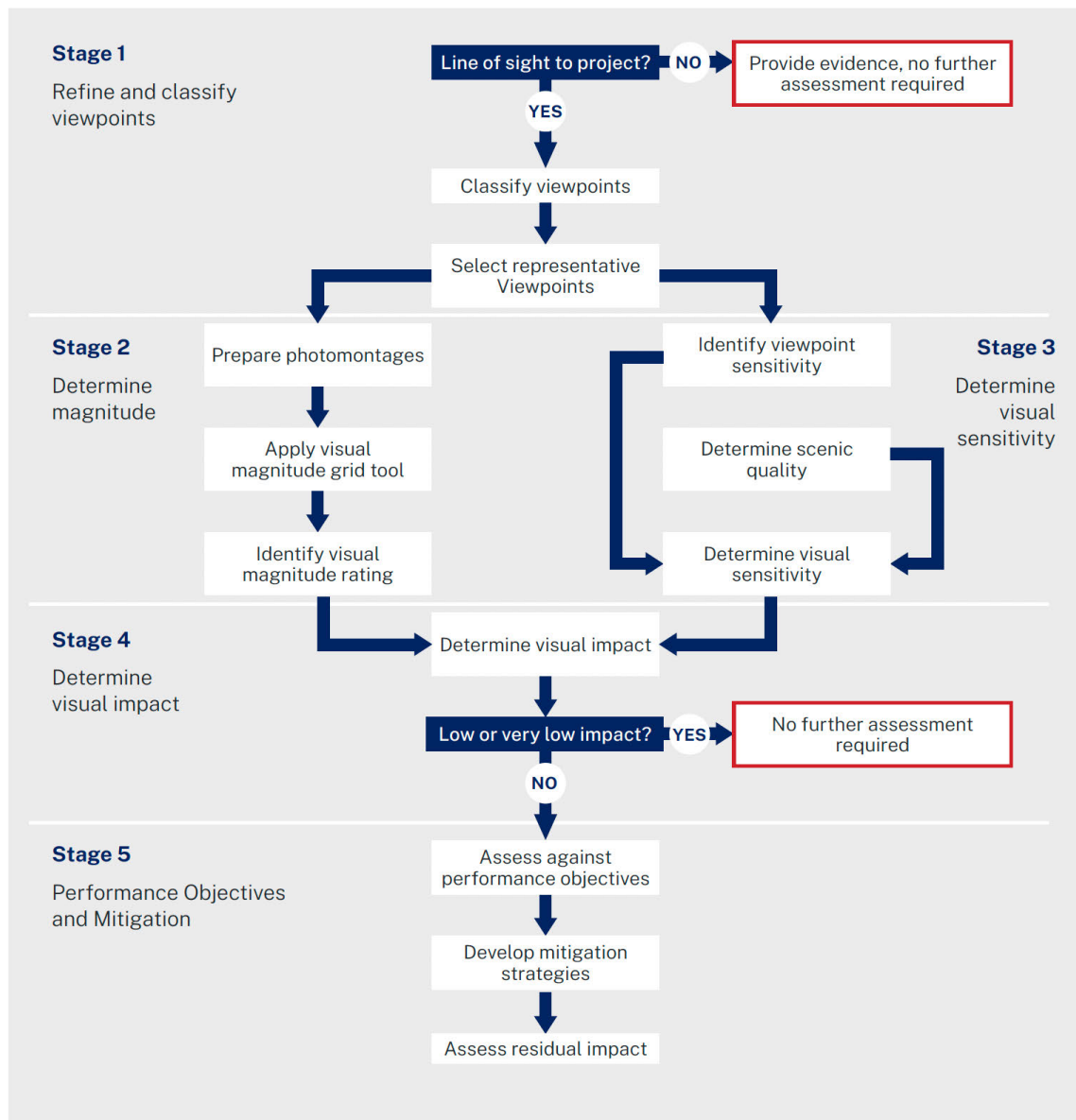
From here, the assessor can determine whether specific locations will require a detailed assessment, using a prepared photomontaged view – see below for the process of selection, or otherwise, contained within the DPIE technical guidelines.

3.2 Detailed viewpoint assessment

The detailed assessment stage is used to undertake a comprehensive assessment of the visual impacts on viewpoints identified in the preliminary assessment, including any strategies to mitigate these impacts.

The detailed assessment must be prepared in accordance with the process outlined in **Figure 5** described below.

Figure 5: Detailed visual impact assessment process



Photomontages were prepared, by Iris, for the key public viewpoints and nearest neighbours. These were verified by a surveyor and prepared in accordance with the requirements of the draft guideline (2021). These photographs combine a modelled image of the solar farm with a photograph using 3D modelling and photo editing techniques. For each location, a photomontage was prepared for the Project at:

- Day one (without mitigation), and then with the proposed vegetation screening shown in the
- Medium term (shrubs modelled at 3 metres and trees at 5 metres, about 2–5 years), and
- Long term (shrubs about 6 metres and trees ranging from 10-20 metres, about 10–15 years).

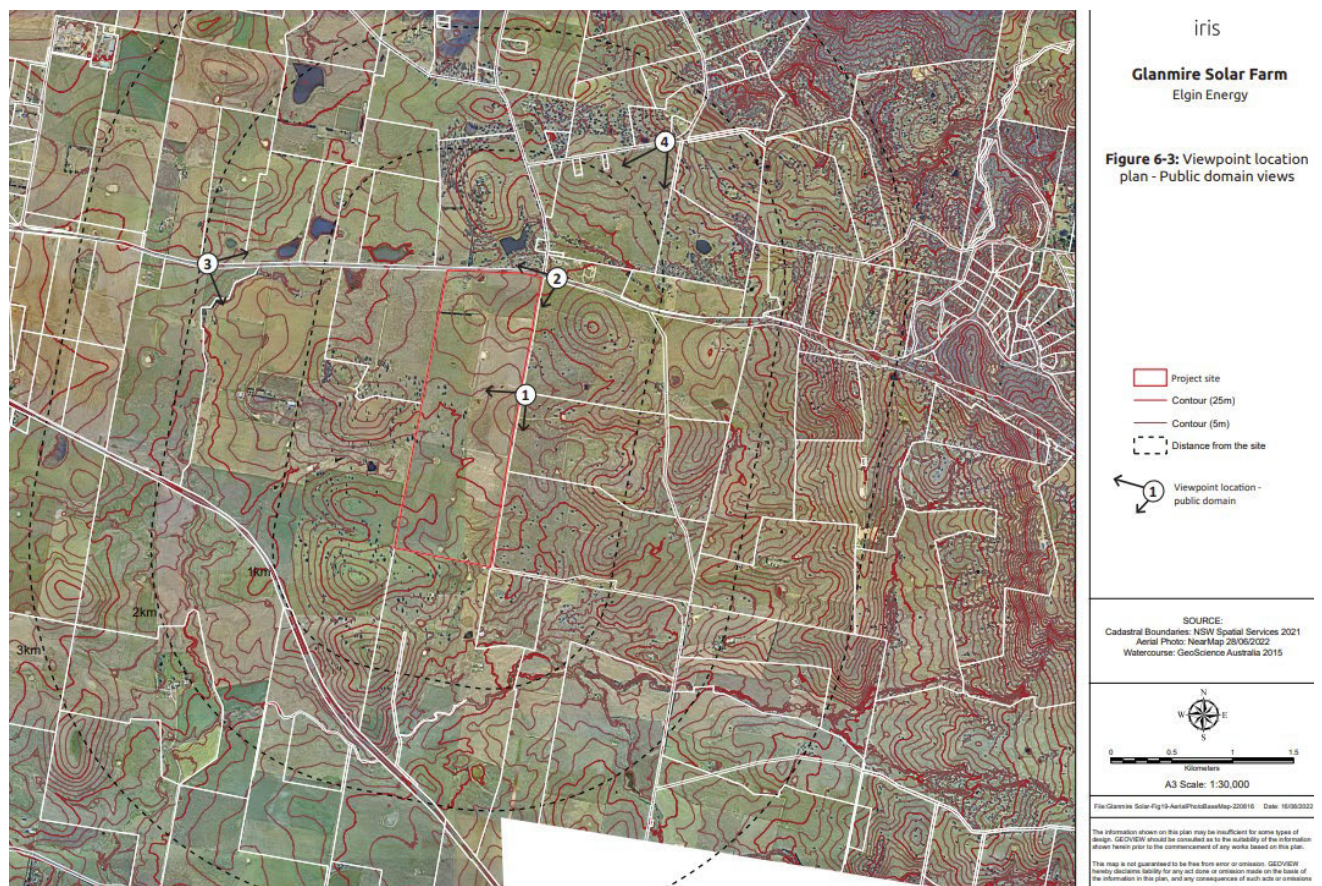
Table 3: Panoramic photography requirements

Parameter	Requirement
Camera	<ul style="list-style-type: none"> • Full frame camera • 50mm focal length of lens • Camera positioned 1.5m above the ground • Use of tripod (with levelling tools) and panoramic head • Photographs taken in portrait orientation
Composition	<ul style="list-style-type: none"> • Horizon positioned at the midpoint of the photographs • Multiple photographs taken every 15 degrees or at such frequency to provide adequate overlap (approximately 30%) between images
Location and conditions	<ul style="list-style-type: none"> • Where possible, photographs should be taken with no or minimal cloud cover and when the sun is positioned high in the sky (generally between the hours of 9 am and 3 pm)
Merging photographs	<ul style="list-style-type: none"> • Photographs merged to achieve a panoramic photograph with 180° horizontal field of view • Merged panoramic photographs avoid distortion or warping of the individual images

These are the DPIE guidelines for the development of the photomontaged views.

Selection of Public Viewpoints:

Four public viewpoints have been presented within the Iris VIA – see map below for locations. None of these viewpoint consider the impact of the only buildings that form part of the design proposal, located near the northeastern corner of the subject site.



6. URBAINE REVIEW OF IRIS VISUAL IMPACT ASSESSMENT

Urbaine has undertaken a review of the submitted Visual Impact Assessment, from Iris Visual Impact + Design, and has attempted to review each essential component of such a report, those being:

- Method and accuracy
- Choice of views
- Assessment accuracy of views
- Mitigation design and appropriateness
- Conclusion and Recommendations.



Aerial photo, indicating location of the 4 public viewpoints



The aerial photo, above, shows the location of the selected public viewing points from the Iris Visual Impact Assessment. These are reviews below and the analysis on accuracy can be applied to other selected views, public and private.

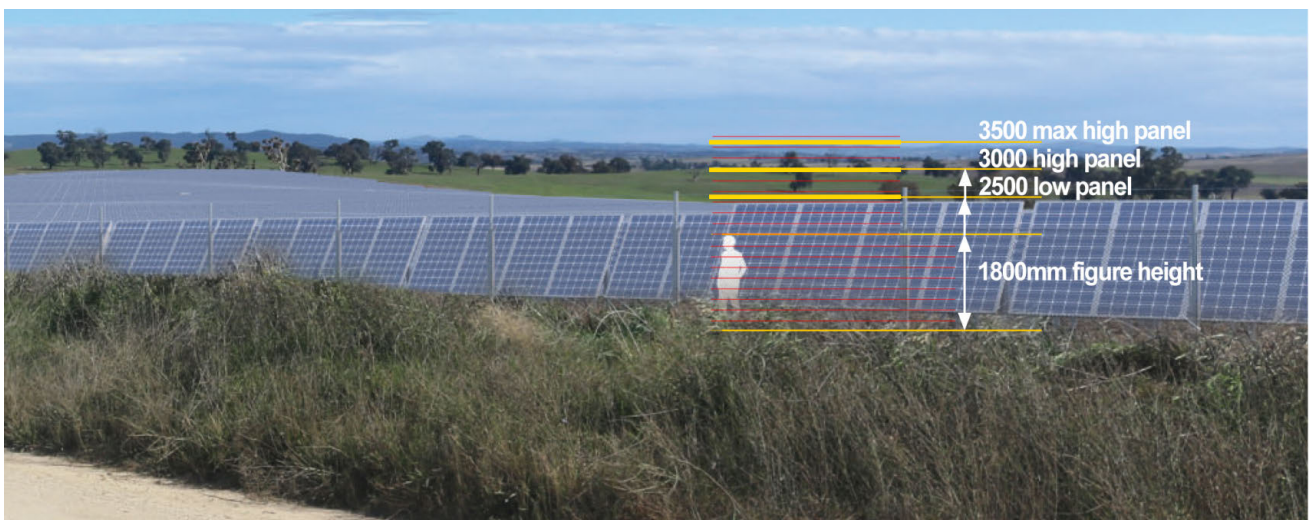
This is the first public viewpoint in the report, from the publicly accessible road, Brewongle Lane, running along the eastern boundary of the subject site. Middle distance, rolling fields are observed with a far distant view of significantly larger hills to the south.



This diagram, from the Iris report, shown the alignment of the CAD / LIDAR 3d model onto the background photograph. However, it can be seen that the alignment is only approximate, with the existing treetops still visible above the overlay. This will result in a CAD model position lower than a true representation. See below for a closer view of the misalignment:



Although this discrepancy could be observed as minor, it is of the order of several metres at such a distance that the impact is far greater in the foreground, which is of greater relevance.



This is VP1 and includes the overlay of the 3d panel CAD model. It can be seen that the highest panels are below the minimum outlined in the project description, at 2400mm. If the higher panel position had been used, this indicates a misalignment of approximately 600mm. If the panels were shown at 3000mm, to the upper

frame, then the impact would be far greater and upon far more critical parts of the landscape in the distance and the far distance, in particular. In order for a fair assessment to be made of the visual impact, the accuracy of the model placement is critical.



Within the same image, VP1, a depiction of the security fence is indicated along Brewongle Lane. The fence appears as almost transparent as the view becomes more distant and oblique. However, as can be seen from an installed fence (see photo below), the framing and mesh begin to align as the view becomes more distant, forming an ever-increasing opacity to the screening. This is misrepresented in all the views within the Iris report and ignores a very significant component of the visual impact and potential view loss. Again, this prevents a true assessment being made of the impact.



This is an installed fence for a similar solar panel installation, indicating the scale and the solidity of the elements as they begin to align with distance. This should be indicated on the subject proposal for a true assessment to be made of the visual impact, prior to any mitigation.



This version of VP1 indicates the site with mature landscape. It can be observed that the valuable component of the view, the rolling hills to the south, are obscured by the imposed landscape, while a large portion of the panels remain visible through the trees. Also, the depiction of the security fence in all images is significantly underestimated, as already noted. The mitigation measures, including the continuous, relatively orthogonal, line of trees, serves to create another non-natural feature within this very random landscape and is discussed later in this review. The formality of the planting does not relate to the surroundings and a more undulating layout, within the parameters of the planting zone could be considered.

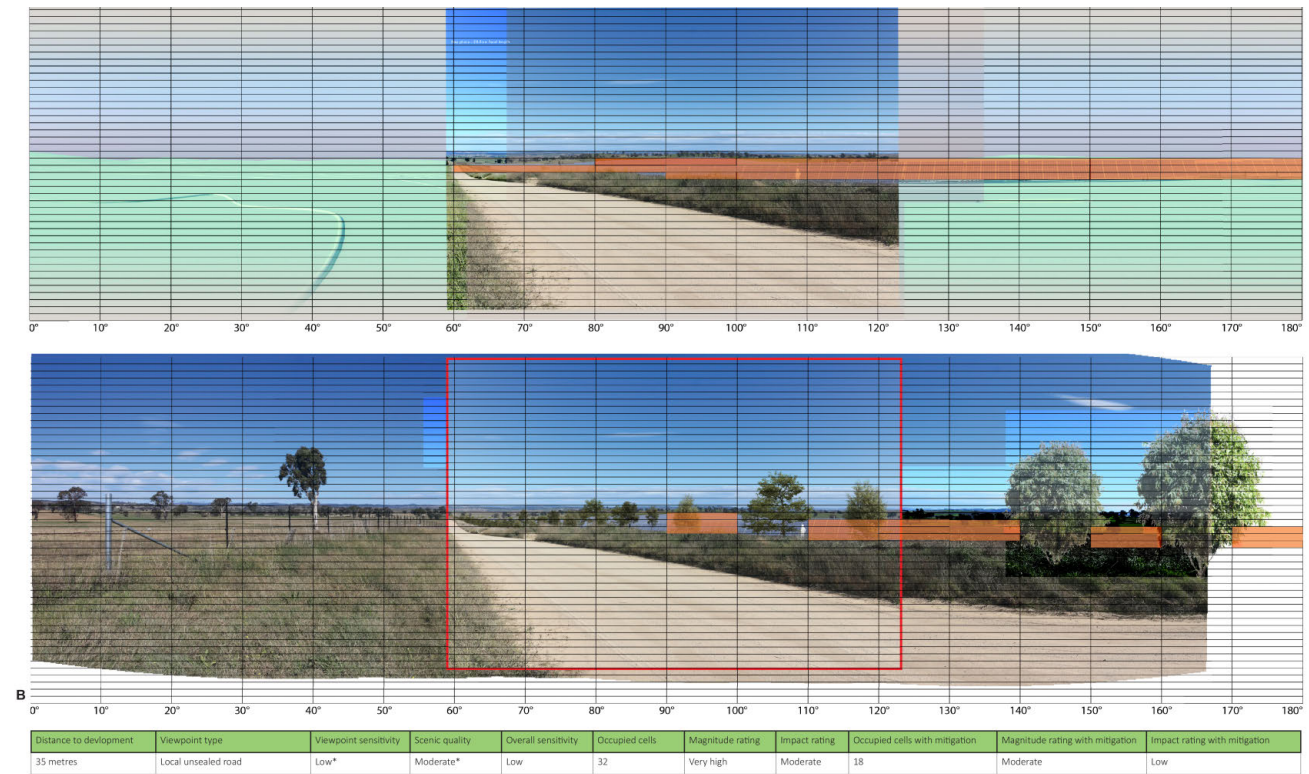


Figure B12: Viewpoint 1: View south from Brewongle Lane, magnitude analysis
Date: September 2022

The magnitude analysis diagram, above, indicates a diminishing visibility of the panels and fence. However, these items remain visible, particularly if deciduous trees and vegetation are incorporated. The second analysis diagram does not reflect this, instead removing any panel indication that contain even a portion of landscape, which should not be the case. Rather, when a portion of the panels remains visible, the coloured block should remain active.

TABLE 6-6 VIEWPOINT 1: VISUAL IMPACT ANALYSIS SUMMARY

Viewpoint type	Viewer sensitivity	Scenic quality	Overall sensitivity
Local unsealed road	Low*	Moderate*	Low
Distance to development	Occupied cells (unmitigated)	Magnitude rating	Impact rating
35 metres	32**	Very high	Moderate
Mitigation measures	Occupied cells (mitigated)	Magnitude rating	Impact rating
<ul style="list-style-type: none"> Linear scattered trees along Brewongle Lane Vegetation along the western boundary of the site. 	18**	Moderate	Low

* Adjusted from level indicated in the Technical Supplement (DPE 2022) to reflect community values / planning intentions.

** Refer to Appendix B, Figure B12.

This is the Iris analysis of the visual impact for VP1. The Impact Rating has been categorized as Low. However, many elements have not been accurately portrayed in the photomontaged images and the unnatural placement of trees, in a row, aligning the lane, creates a visual impact in itself, in relation to the unplanned nature of the surrounding landscape, both near and distant. Significant amounts of distant views are obscured by the panels, when shown at the correct height and further covered with the imposed landscaping.

Viewpoint 2: View west from the Great Western Highway



FIGURE 6-7 VIEW WEST FROM THE GREAT WESTERN HIGHWAY

This is the Iris Viewpoint 2, VP2, being a selected view from the Great Western Highway travelling from east to west. It is taken from the northern side of the dual carriageway and does not, therefore, represent a vehicle travelling in this direction, which would be positioned on the southern part of this road. The first set of trees along Brewongle Lane are referred to later in this section of the report and can be clearly identified in this image. The image does not include what is possibly the most critical portion of the view – namely the northeastern corner of the subject site and the location of the panels and substation.

For the purposes of assessment, from the most likely point of impact, we have selected an alternative view, looking due south up Brewongle Lane – see below. This serves to reflect the points of our analysis, but includes the full extent of the site to the northeastern corner.



This is a portion of the overall site map, showing the location of this view, VP2 and also the relevant elements that can be used as reference points for the placement of the panels and surrounding landscape.



This is VP2, as selected by Urbaine. This is at the junction of Brewongle Lane and the Great Western Highway, looking south.

V5	Lighting at the BESS and substation would be designed and operated in accordance with AS/NZS 4282:2019 Control of the obtrusive effects of outdoor lighting.	Operation
V6	The solar inverter stations, switch rooms, battery enclosures, office and maintenance building, and water tanks to be a neutral colour, such as grey, to reduce their prominence in views from surrounding dwellings where visible.	Operation

The EIS notes above outline the support structures that are incorporated into the site design. No views have been selected that indicate this, or assess the lighting involved in their operation. As will be seen below, it is likely that these buildings will be seen from the Great Western Highway.



This image shows the northeastern corner of the site, with levels overlaid to indicate the high and low extents of the topography. It appears that, with the setback included, the panels, at up to 3500mm high, will be visible from this location. More importantly, the substation and associated structures will also be visible.



Figure 3-5 Typical substation; Molong Solar Farm (33/66kv connection).

From this viewpoint, the substation would also be visible, with its higher profile and solid volume. This has not been shown, or assessed, anywhere within the Iris report. Above is a photograph of a typical substation associated with a project of this scale. More detail of this is contained within the EIS Appendices.



This image shows the northern boundary and northwestern corner of the site, with levels overlaid to indicate the high and low extents of the topography. It appears that, with the setback included, the panels, at up to 3500mm high, will be visible from this location. The screening will create another layer of visual obstruction to the distant mountain views to the south.



The Vision Bathurst 2040 Bathurst Local Strategic Planning Statement, 2020 states:

The Bathurst Region enjoys a range of important landscapes and vistas. The gateways into the urban areas of the city, particularly along the Great Western Highway and Mitchell Highway, have undergone new plantings under Council's Vegetation Management Plan to achieve a strong unified landscaped environment that recognises the transition between the rural and urban landscapes with natives merging to exotics.

From this, the key locations for views should be considered as being along these 2 main approach roads. In the instance of the Great Western Highway, the earlier review of the images shows that the impact will actually be more significant than shown in the Iris report. Additionally, the impact of the mitigation measures should also be assessed within the zoned area at the northern end of the site. Below are a series of images along the main approach road to Bathurst in both directions (refer to map above) demonstrating the potential visibility of the project and the need for these views to be further assessed as a priority.



suggested viewpoint 1



suggested viewpoint 2



suggested viewpoint 3



suggested viewpoint 4



suggested viewpoint 5



suggested viewpoint 6



suggested viewpoint 7



suggested viewpoint 8



suggested viewpoint 9



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Glanmire Solar Farm
Elgin Energy

Figure B6: View east along the Great Western Highway, existing view
Date: September 2022 Issue: RevA

Public viewpoint no.3 (VP3).

This is the third public viewpoint in the report, from the one of the main arterial access roads to Bathurst, the Great Western Highway.



This diagram shown the alignment of the CAD / LIDAR 3d model onto the background photograph. However, it can be seen that the alignment is only approximate, with the existing treetops, in the middle distance, still visible above the overlay. The alignment of the distant skyline is also noticeably inaccurate. This will result in a CAD model position lower and horizontally misaligned with the original photograph.



This photomontaged view shows the misplaced model of the solar panels, as a result of the inaccurate survey overlay. Certain elements are shown as being on the western side of the site and should be on the east and also vice versa. Their clear visibility would suggest that glare distraction to vehicles travelling east, or west, along the Great Western Highway, should be considered

The Glanmire Solar Farm fact sheet from October, 2022, suggests the new poles will be between 2m and 6m higher than the existing and with larger conductors, as shown below.



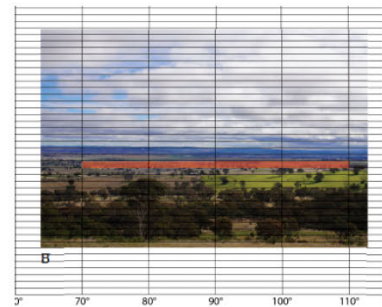
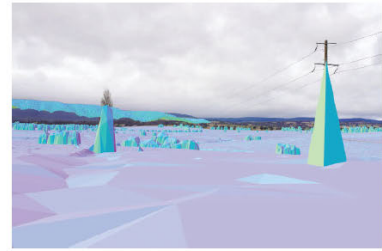
Within the views along the Great Western Highway, consideration should have also been given to the upgraded utility poles that will accompany the development. These are higher than the existing poles and made of concrete – see attached for an estimated visual comparison.

Since this is one of the two 'gateway' access roads to Bathurst, the visual impact of larger utility poles should have been considered within the visual impact assessment. In addition to their size, the likely use of concrete, because of their size, introduces another man-made element into the scene.

Visual amenity: landscape and public viewpoints

Key Results

- **Low landscape character impact** – no mitigation required but it is noted the mitigation proposed may locally enhance landscape character due to the revegetation of two streams within the site with riparian vegetation, and the planting of hundreds of scattered trees around the perimeter of the site.
- **Very low visual impact on views east bound from the Great Western Highway** - with mitigation this reduces to no impact in the long term.
- **No visual impact from the Great Western Highway on the approach to Bathurst** - due to set backs and an array exclusion zones proposed.
- **A moderate visual impact on views from Brewongle Lane**, reducing to low visual impact with the implementation of the landscape plan.
- **This Project would not have a significant impact on the scenic quality, visual character and setting of Bathurst.**



| 11

The claim that there is no visual impact from the Great Western Highway, travelling west, is disputed, as per the assessment above. In the other direction the visual impact will be reduced by the proposed landscaping, but this introduces a very intense and unbroken line of trees into a very random and undulating setting. The trees are visual screening, but they themselves create visual impact.

Viewpoint 4: View south from Mersing Road



FIGURE 6-10 VIEW SOUTH FROM MERSING ROAD, EXISTING VIEW



This is the actual view from the position VP4, shown on the viewpoint location map, within the Iris VIA. The topography is very different to that shown in their report, as above. Our conclusion is that this has been incorrectly located on the plan and we are unable to review this in a meaningful manner. However, from the elevation of the Iris image, the panels would be clearly visible and mitigation measures, as we describe later, would be necessary.

Below is a summary table from NGH Environmental of the visual impacts from the public domain from the 4 images above.

The visual impact values vary from moderate to very low. However, seen alongside the inaccuracies of the images, both in terms of model positioning and scale of the actual panels, this assessment cannot be relied upon. Most importantly, VP2, which should read 'View west from the Great Western Highway', is impacted, both with the panels and substation and with the associated screening trees.

6-2 Summary of visual impacts from the public domain

		Without mitigation			With mitigation (medium term)	
	Viewpoint number and location	Sensitivity	Magnitude	Visual impact	Magnitude	Visual impact
1	View south from Brewongle Lane	Very low	Very high	Moderate	High	Low
2	View southeast from the Great Western Highway	Low	Nil	No impact	Nil	No impact
3	View east from the Great Western Highway	Very Low	Very low	Very low	Nil	No impact
4	View south from Mersing Road	Very low	Very low	Very low	Nil	No impact

The other assessment scales do not seem to reflect the orthogonality of the proposed landscape and its non-natural impact upon the environment. This is covered later in the report.

7. MITIGATION.

Within Appendix B of the overall submission, by NGH Environmental, is an outline of the proposed mitigation measures to be applied alongside the installation of the panels. The EIS also contains more detailed explanations from CUSP Landscape Architects in Appendix A.

Table 6-5 Visual mitigation measures

Mitigation number	Mitigation measure	Project stage
V1	<p>The following design measures must be included in the final infrastructure layout (and are included in the Indicative infrastructure layout, Appendix F.2):</p> <ul style="list-style-type: none"> Visible solar farm infrastructure 300 metres back from the Great Western Highway to reduce the visibility of the project from the Highway and dwellings to the north A solar panel exclusion zone included to reduce glimpse views for motorists west bound from the Great Western Highway. Setbacks from the southern site boundary where the nearest neighbouring dwellings are located Location of the Substation, BESS, and Operations and maintenance facility to the south of a natural rise in landform, to reduce its 	Design

From the earlier image review within this report, the impact on the Great Western Highway has been underestimated / miscalculated and the mitigation suggestions for these view positions are perhaps not sufficient.

The Substation and BESS are not shown in any of the imagery, neither is the night lighting for these facilities assessed.

4.0 Landscape Type - Supplementary native screen planting

1. SUPPLEMENTARY NATIVE SCREEN PLANTING TO EXISTING TREES

The supplementary planting will ensure that adequate screening will be provided for the longer term once the existing conifers reach the end of their life. A mix of native trees and shrubs with a dense and compact habit have been selected to provide a maximum screening effect. A parallel row of trees will be planted to fill any gaps and screen once the conifers are gone.

SPECIFICATION NOTES

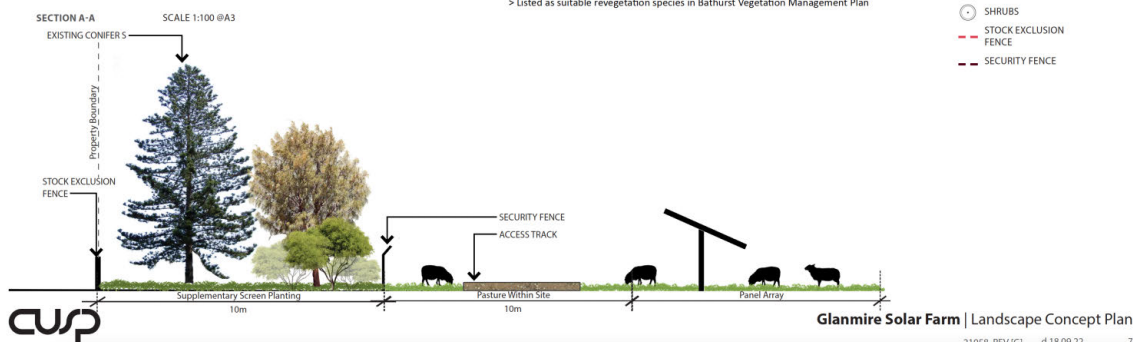
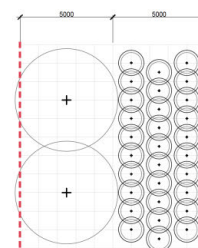
- Planting holes (2x size of root ball) to be cultivated and ameliorated (no ripping due to existing trees)
- Tree ring (1m diameter) to be covered with 100mm thick well composted organic mulch (will act as weed suppressant)
- Plants will be 50 x 50 mm tubestock or similar
- Individual trees to be screened off with temporary tree guard to prevent grazing pressure until tree has matured
- 12 week establishment followed by a 21 month monitoring period (total of 24 months)
- Activities during establishment would include watering, weed management and replacement of dead plant stock as required.
- Activities during the monitoring period would include weed management, topping up of mulch as required, repairing tree guards and replacing dead plant stock as soon as practicable.

Plant Species List

Scientific Name	Common Name	Height at Maturity	Source
Trees			
<i>Acacia dealbata</i>	Silver Wattle	10m	* >
<i>Acacia implexa</i>	Hickory Wattle	10m	>
<i>Acacia melanoxylon</i>	Black Wattle	10m	>
<i>Allocasuarina littoralis</i>	Blackwood	10m	>
<i>Allocasuarina verticillata</i>	Drooping Sheoak	10m	>
Shrubs			
<i>Acacia buxifolia</i>	Box leaf Wattle	4m	>
<i>Acacia genistifolia</i>	Early Wattle	3m	>
<i>Acacia rubida</i>	Red Stem Wattle	5m	*
<i>Bursaria spinosa</i>	Blackthorn	5m	>
<i>Callistemon citrinus</i>	Crimson Bottlebrush	3m	>
<i>Coprosma quadrifida</i>	Prickly Currant-bush	2-4m	>
<i>Daviesia latifolia</i>	Bitter Pea	3m	>
<i>Dodonea viscosa</i>	Hop Bush	4m	>
<i>Hakea dactyloides</i>	Finger Hakea	3m	>
<i>Leptospermum grandifolium</i>	Mountain Teatree	1.5-6m	>
<i>Leptospermum obovatium</i>	Tea Tree	3m	*

* Suggested by Ecologist or based on PCT1130

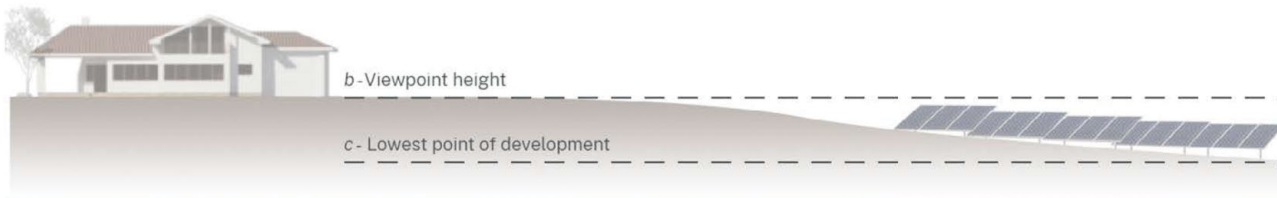
> Listed as suitable revegetation species in Bathurst Vegetation Management Plan



Within the IRIS report, preliminary assessments, regarding the visibility of the installation have dismissed many residential receptors as being unaffected by the proposal. However, this ignores that the potential landscape mitigation measures as being an integral part of the overall scheme. This will, in almost all instances be visible, even if the panels are not – see section below for on overlay of the landscape barriers upon a 'non-impacted' house.

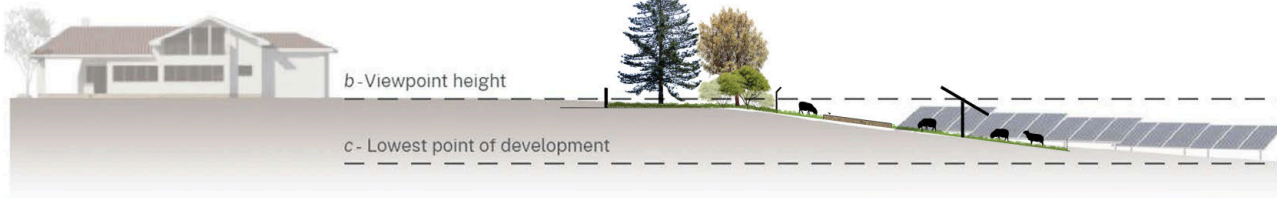
The reference image of the Department of Planning and Environment Technical Supplement - Landscape and Visual Impact Assessment

Project located below viewpoint ($b-c$)



Here, the preliminary assessment suggests no Impact.

Project located below viewpoint ($b-c$)



However, the visual impact / view loss will still be observed by the resident as a result of the mitigation landscaping. This will be required to satisfy other receptors, but impacts on this one also.

The images below serve to indicate the potential loss of view, as a direct result of the mitigating landscape being proposed to conceal the solar arrays. The tree screening obscures almost the entirety of the middle-distance views, while concealing parts of the hills in the far distance also. The orthogonal nature of the tree layout does not attempt to follow any ideas of a natural placement and serves to reinforce the impact of man-made elements in a very natural environment.



Image from Iris VIA indicating extent of solar arrays from a private house viewpoint.



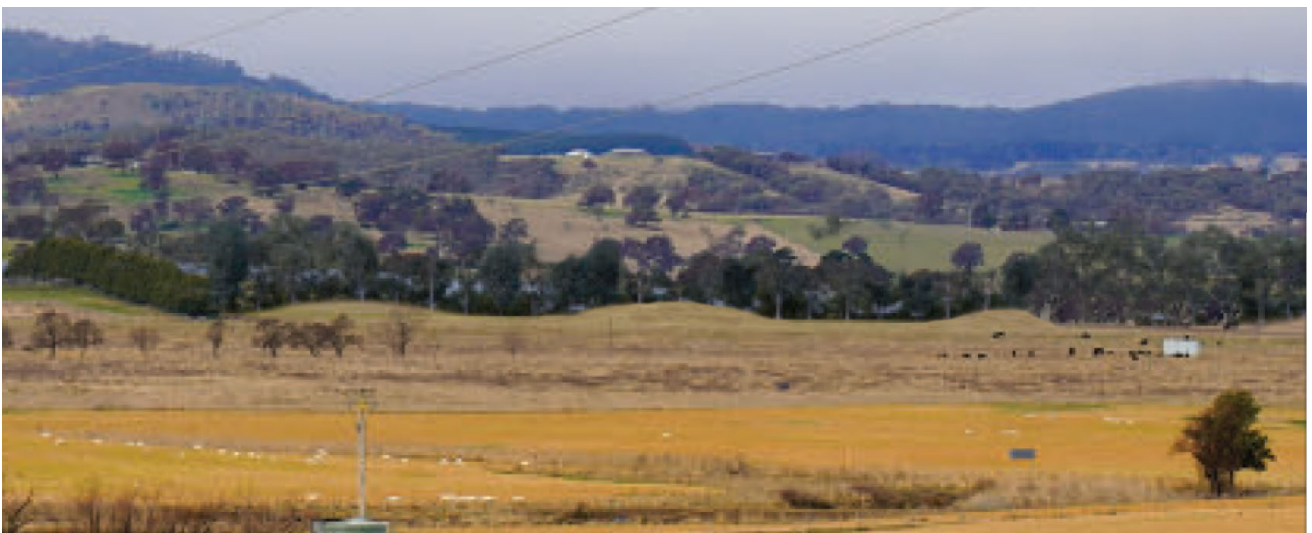
Image from Iris VIA indicating extent of solar arrays from a private house viewpoint, showing the mitigating landscape proposals.

Furthermore, the screening proposal is not responding to the existing landscape, which consists of gently undulating land and random groups of trees and individual trees. By providing a continuous line of screening trees, the impact is a relatively 'unnatural' one. The recommendation would be to include selective locations for land mounding, allowing a breakup of the continuous tree line and a more responsive solution to the site and to the problem of concealing the panels. The interspersed solid earth mounding will also serve to break up the potential for glare impact in a continuous, albeit filtered, line.

See an example below of a mixture of tree screening and mounding, seeking to break the continuous line of the current mitigation proposal, in comparison to the current proposal, with little variation in height, or scale and a stark imposition upon a very gentle landscape.



Current recommendation for mitigating landscape to the western boundary of the site.



The same view with small undulations in the landform and a variety of tree heights that correspond to this.

The second options can be considered, visually, more appropriate for a landscape with a very undulating topography and appears far more 'natural'.

Ref. No.	Property address	Distance to the panel arrays	Identify views to be affected.	From what part of the property are the views obtained.	Visible area of the proposal	Potential impact	Effect of vegetation screening	Potential impact with mitigation
4	264 Brewongle Lane Brewongle	215m	This property has medium and long-range north, east and south facing views, over undulating rural fields oriented towards the Winburndale Range and the surrounding hills.	Northwest-facing windows of the dwelling, northern part of the garden, and the driveway.	The solar panels would be set back from the site boundary, over 500m away from this dwelling. The southern part of the Project would be seen in northerly views from the dwelling, northern part of the garden and the driveway.	Very low	The vegetation proposed along the southern boundary of the site would further screen the solar farm infrastructure over time.	Very low
5	244 Brewongle Lane Glanmire	325m	This property has panoramic views over undulating rural fields towards the Winburndale Range and the surrounding hills.	North-facing windows of the dwelling, northern part of the garden, and the driveway.	The solar panels would be set back from the site boundary, over 450m away from this dwelling. The south eastern part of the Project would be seen in north easterly views from the dwelling, northern part of the garden and from the driveway. The Project would comprise a small part of the panoramic views from this property and would not obstruct views to the Winburndale Range and the surrounding hills.	Very low	The vegetation proposed along the southern boundary of the site would further screen the solar farm infrastructure over time.	Very low
7	4887 Great Western Highway Glanmire	466m	This property includes a single storey house, surrounded by mature trees and shrubs in the garden. Although there may be glimpses to northern parts of the site, there is not likely to be clear views to the site from this property due to the intervening vegetation and landform.	Glimpses from east facing windows and veranda of the house, eastern parts of the garden, fields to the east of the dwelling and the driveway. <15% of the Project visible from the house and garden, and up to 30% of the Project potentially visible from the central part of the driveway.	The Project would be glimpsed from the house and garden due to intervening trees and shrubs within the garden and adjacent field. From the driveway a small part of the Project would be visible in easterly views from the central part of the driveway, where there are no trees obstructing views to the site. From fields close to the site, the Project would be prominent.	Very low	The vegetation proposed for the western site boundary of the solar farm would partially screen views to the Project over time.	Very low
44 ¹³	119 Brewongle Lane, future house site					Low		Very low
44b	119 Brewongle Lane, future house site					Low		Very low
44c	4985 Great Western Highway, Glanmire, future house site					Low		Very low

The table above, from the Iris VIA, suggests that the visual impact from a random selection of private receptors is between 'very low' and 'low'. In light of the assessment, above, of the imposition of unbroken tree-screening to a natural environment, much of which will obscure middle and distant views, I would suggest these figures are not a reasonable assessment of the impact.

8. GLARE

The assessment of glare is directly related to the visibility of the panels. In many instances this has been not fully represented in the Iris report and the glare assessment values will also be compromised as a result. The tree screening purposely allows glimpses through the panel arrays and hence creates apertures for potential glare to both those on foot and in vehicles. This should be resolved in line with the landscaping proposals and would suggest landforming in addition to landscaping.

9. CONCLUSION

Within the Summary Report from NGH Environmental, the assessment of visual impact is described as follows:

The greatest potential visibility of the Project is in areas adjacent to the site, particularly on the slopes facing the site to the east, south and west. Hills to the east, south and southwest of the site limits any views to the site from areas beyond these hills. There are areas of potential visibility on the elevated ridgeline about 2.5–3km to the east of the site and there are areas of potential visibility to the south between 1–3km from the site. To the west there is some potential visibility on the fields between 2–3km from the site but not extending to Raglan. There is visibility to the northwest of the site, on elevated locations, particularly at about 2km from the site.

Figure 6-4 shows the receivers (dwellings) requiring detailed assessment. The reverse view shed is also included, showing those parts of the site most visible to local dwellings.

This review of the Visual Impact Assessment, from Iris Visual Impact + Design, forming part of Environmental Impact Statement for Development Application Number SSD-21208499. There are a

number of areas of concern that relate to the design and also to the accuracy of the assessment, together with inadequacies in the landscaping proposal.

These include:

- Inaccuracy of the LIDAR Data model placement and, ultimately the overall placement of the proposed 3d model.
- Inaccuracy of panel heights shown within the model – averaging 2400mm. The panels vary between 2500mm and 3500mm, creating a greater impact than shown.
- Inaccuracy of camera positions on location map.
- No accounting for mitigation screening in early assessments that have deemed ‘no impact’.
- No landscape response to the overall variety and topography of the land. Instead a continuous line of trees, creating a relatively ‘unnatural’ addition to a very random existing piece of landscape.
- Ignoring of the most important approach roads, in one instance claiming the panels would not be visible, despite the contours indicating the opposite.
- No indication of the substation and associated facilities in the views from the Great Western Highway.
- No visibly accurate indication of the security fencing around the site.

Our recommendations are largely contained within the report above and include the following:

- Assessment of the mitigation measures that will be visible in all the views previously deemed non-impacted.
- Further investigation along the main approach roads, with more accurate portrayal of the panels, landscaping and substation buildings.
- A more detailed ‘cloud point survey of the site to allow accurate verification of the proposal’s positioning and the scale and height of the panels.
- A revised landscape plan to include landforming to vary the continuous like of tree and to integrate more respectively into the existing surroundings.

10. APPENDIX A:

Aspinall CV and Methodology article – Planning Australia, by Urbaine Design Group.

JOHN ASPINALL Director, URBaine Design Group Pty. Ltd.
ABN: 31 654 488 043

Qualified UK Architect RIBA, BA(Hons), BArch(Hons) Liverpool University, UK.

24 years' architectural experience in London and Sydney.

Halpin Stow Partnership, London, SW1

John Andrews International, Sydney

Cox and Partners, Sydney

Seidler and associates

NBRS Architects, Milsons Point

Design Competitions:

UK 1990 – Final 6. RIBA 'housing in a hostile environment'. Exhibited at the Royal Academy, London

UK Design Council – innovation development scheme finalist – various products, 1990.

Winner: International Design Competition: Sydney Town Hall, 2000

Finalist: Boy Charlton Swimming pool Competition, Sydney, 2001

Finalist: Coney Island Redevelopment Competition, NY 2003

Design Tutor: UTS, Sydney, 1997 – 2002

This role involved tutoring students within years 1 to 3 of the BA Architecture course. Specifically, I developed programmes and tasks to break down the conventional problem-solving thinking, instilled through the secondary education system. Weekly briefs would seek to challenge their preconceived ideas and encourage a return to design thinking, based on First Principles.

Design Tutor: UNSW, Sydney 2002 – 2005

This role involved tutoring students within years 4 to 6 of the BArch course. Major design projects would be undertaken during this time, lasting between 6 and 8 weeks. I was focused on encouraging rationality of design decision-making, rather than post-rationalisation, which is an ongoing difficulty in design justification.

Current Position: URBaine Design Group Pty Ltd

Currently, Director of Urbaine Design Group - design development and visualisation consultancy: 24 staff, with offices in: Sydney, Shanghai, Doha and Sarajevo.

Urbaine specialises in design development via interactive 3d modelling and also in dispute resolution in view loss situations.

Urbaine's scale of work varies from city master planning to furniture and product design, while our client base consists of architects, Government bodies, developers, interior designers, planners, advertising agencies and video producers.

URBAINE encourages all clients to bring the 3D visualisation facility into the design process sufficiently early to allow far more effective design development in a short time frame. This process is utilised extensively by many local and international companies, including Lend Lease, Multiplex, Hassell, PTW, Foster and Partners, City of Sydney, Landcom and several other Governmental bodies. URBaine involves all members of the design team in assessing the impact of design decisions from the earliest stages of concept design.

Because much of URBaine's work is International, the 3D CAD model projects are rotated between the various offices, effectively allowing a 24hr cycle of operation during the design development process, for clients in any location.

An ever-increasing proportion of URBaine's work is related to public consultation visualisations and assessments. As a result, there has also been an increase in the Land And Environment Court representations. Extensive experience in creating and validating photomontaged views of building and environmental proposals. Experience with 3D photomontages began in 1990 and has included work for many of the world's leading architectural practices and legal firms.

Co-Founder Quicksmart Homes Pty Ltd: 2007 - 2009

Responsible for the design and construction of 360 student accommodation building at ANU Canberra, utilising standard shipping containers as the base modules.

Design Principal and co-owner of STEELFOX Modular Systems Pty Ltd: 2009 to present.

High specification prefabricated building solutions, designed in Sydney and being produced in China and Vietnam.

Steelfox has developed a number of low carbon footprint, modular designs for instant delivery and deployment around the world. Currently working with the Cameroon Government providing social infrastructure for this rapidly developing country and the New Zealand Government for the provision of large-scale affordable, multi-generational housing developments.

Expert Legal Witness: 2005 to present

In Australia and the UK, for the Land and Environment Court. Expert witness for visual impact studies of new developments.

Currently consulting with many NSW Councils and large developers and planners, including City of Sydney, Lend Lease, Mirvac, Foster + Partners, Linklaters.

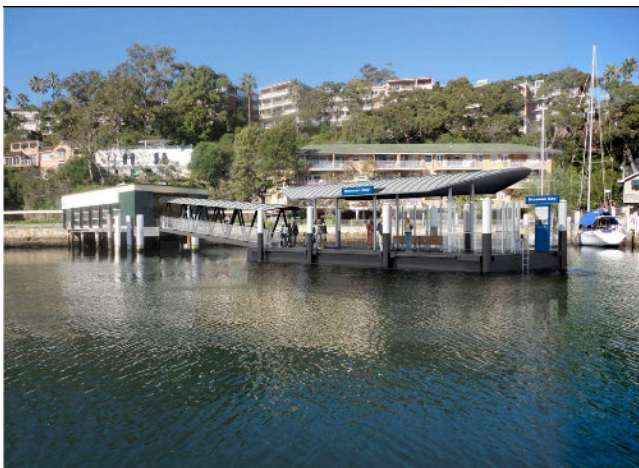


Photomontaged views of new apartment building at Pyrmont: Urbaine

Australia's rapid construction growth over the past 10 years has coincided with significant advances in the technology behind the delivery of built projects. In particular, BIM (Building Information Modelling). Virtual Reality and ever-faster methods of preparing CAD construction documentation.

Alongside these advances, sits a number of potential problems that need to be considered by all of those involved in the process of building procurement. Specifically, the ease with which CAD software creates the appearance of very credible drawn information, often without the thoroughness and deliberation afforded by architects, and others, in years past.

Nowhere is this more apparent than in the area of visual impact assessments, where a very accurate representation of a building project in context is the starting point for discussion on a project's suitability for a site. The consequences of any inaccuracies in this imagery are significant and far-reaching, with little opportunity to redress any errors once a development is approved.



Photomontaged views of new Sydney Harbour wharves: Urbaine

Urbaine Architecture has been involved in the preparation of visual impact studies over a 20 year period, in Australia and Internationally. Urbaine's Director, John Aspinall, has been at the forefront of developing methods of verifying the accuracy of visualisations, particularly in his role as an expert witness in Land and Environment Court cases.

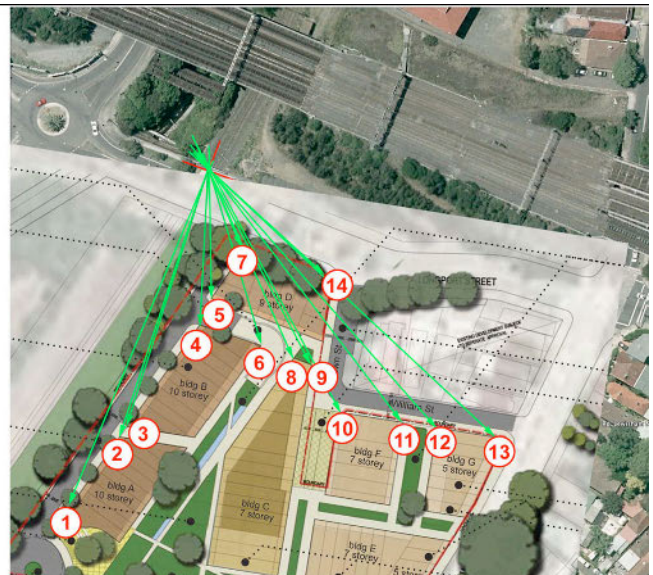
In Urbaine's experience, a significant majority of visualisation material presented to court is inaccurate to the point of being invalid for any legal planning decisions. Equally concerning is the amount of time spent, by other consultants, analysing and responding to this base material, which again can be redundant in light of the frequent inaccuracies. The cost of planning consultant reports and legal advice far exceeds that of generating the imagery around which all the decisions are being made.

Over the last 10 years, advances in 3d modelling and digital photography have allowed many practitioners to claim levels of expertise that are based more on the performance of software than on a rigorous understanding of geometry, architecture and visual perspective. From a traditional architect's

training, prior to the introduction of CAD and 3d modelling, a good understanding of the principles of perspective, light, shadow and building articulation, were taught throughout the training of architects.

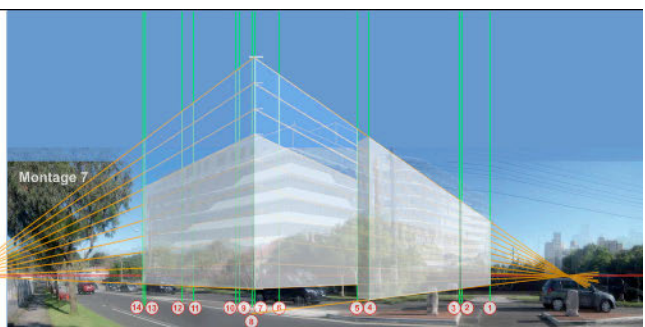
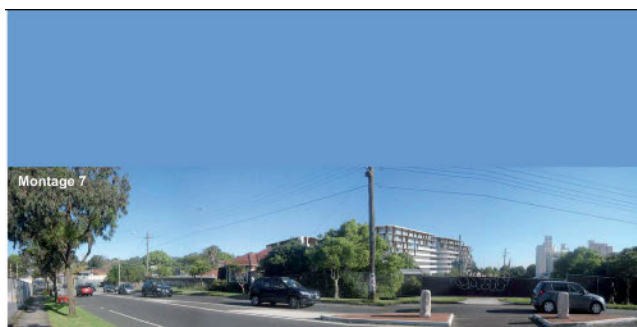
Statutory Authorities, and in particular the Land and Environment Court, have attempted to introduce a degree of compliance, but, as yet, this is more quantitative, than qualitative and is resulting in an outward appearance of accuracy verification, without any actual explanation being requested behind the creation of the work.

Currently, the Land and Environment Court specifies that any photomontages, relied on as part of expert evidence in Class 1 appeals, must show the existing surveyed elements, corresponding with the same elements in the photograph. Often, any surveyed elements can form such a small portion of a photograph that, even by overlaying the surveyed elements as a 3d model, any degree of accuracy is almost impossible to verify. For sites where there are no existing structures, which is frequent, this presents a far more challenging exercise. Below is one such example, highlighted in the Sydney Morning Herald, as an example of extreme inaccuracy of a visual impact assessment. Urbaine was engaged to assess the degree to which the images were incorrect – determined to be by a factor of almost 75%.



SMH article re inaccurate visualisations

Key visual location points on site: Urbaine



Photomontage submitted by developer

Assessment of inaccuracy by Urbaine

Urbaine has developed a number of methods for adding verification data to the 3d model of new proposals and hence to the final photomontages. These include the use of physical site poles, located at known positions and heights around a site, together with drones for accurate height and location verification and the use of landscaped elements within the 3d model to further add known points of references. Elements observed in a photograph can be used to align with the corresponding elements of the new building in plan. If 4 or more known positions can be aligned, as a minimum, there is a good opportunity to create a verifiable alignment.

Every site presents different opportunities for verification and, often, Urbaine is required to assess montages from photographs taken by a third party. In these cases, a combination of assessing aerial photography, alongside a survey will allow reference points to be placed into the relevant 3d model prior to overlaying onto the photos for checking.

The following example clearly demonstrates this – a house montaged into a view, by others, using very few points of reference for verification. By analysing the existing photo alongside the survey, the existing site was able to be recreated with a series of reference elements built into the model. A fully

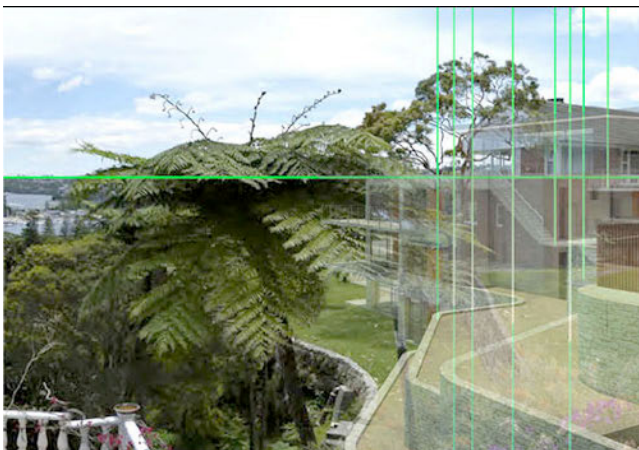
rendered version of all the elements was then placed over the photo and the final model applied to this. As can be seen, the original montage and the final verified version are dramatically different and, in this case, to the disadvantage of the complainant.



Photomontage submitted by developer



Key visual location points on site: Urbaine



Key points and 3d model overlaid onto existing photo



Final accurate photomontage: Urbaine

Often, Urbaine's work is on very open sites, where contentious proposals for development will be relying on minimising the visual impact through mounding and landscaping. In these cases, accuracy is critical, particularly in relation to the heights above existing ground levels. In the following example, a business park was proposed on very large open site, adjoining several residential properties, with views through to the Blue Mountains, to the West of Sydney. Urbaine spent a day preparing the site, by placing a number of site poles, all of 3m in height. These were located on junctions of the various land lots, as observed in the survey information. These 3d poles were then replicated in the 3d CAD model in the same height and position as on the actual site. This permitted the buildings and the landscaping to be very accurately positioned into the photographs and, subsequently, for accurate sections to be taken through the 3d model to assess the actual percentage view loss of close and distant views.



Physical 3000mm site poles placed at lot corners



3d poles located in the 3d model and positioned on photo



Proposed buildings and landscape mounding applied



Proposed landscape applied – shown as semi-mature



Final verified photomontage by Urbaine

Further examples, below, show similar methods being used to give an actual percentage figure to view loss, shown in red, in these images. This was for a digital advertising hoarding, adjoining a hotel. As can be seen, the view loss is far outweighed by the view gain, in addition to being based around a far more visually engaging sculpture. In terms of being used as a factual tool for legal representation and negotiation, these images are proving to be very useful and are accompanied by a series of diagrams explaining the methodology of their compilation and, hence verifying their accuracy.



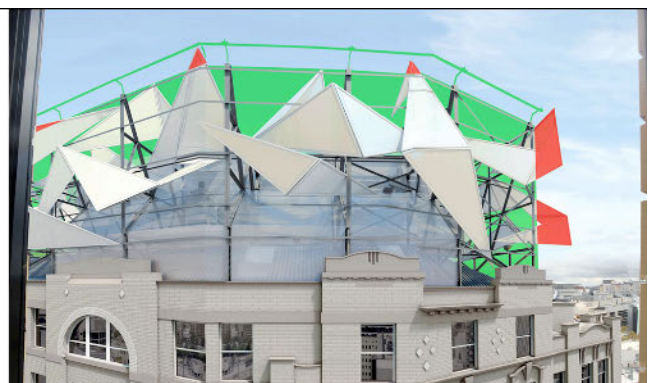
Photomontage of new proposal for digital billboard



Existing situation – view from adjoining hotel

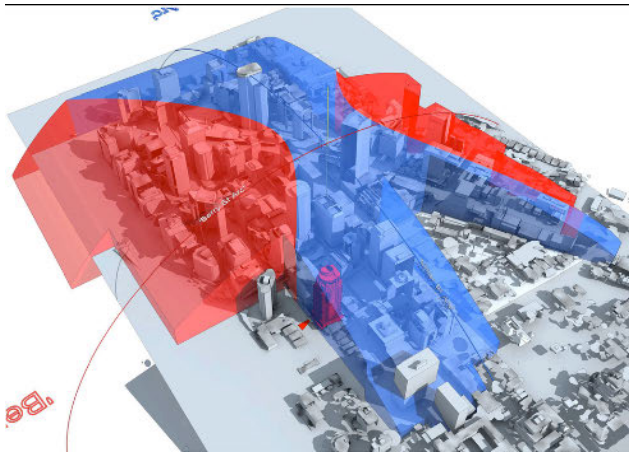


Photomontage of view from hotel

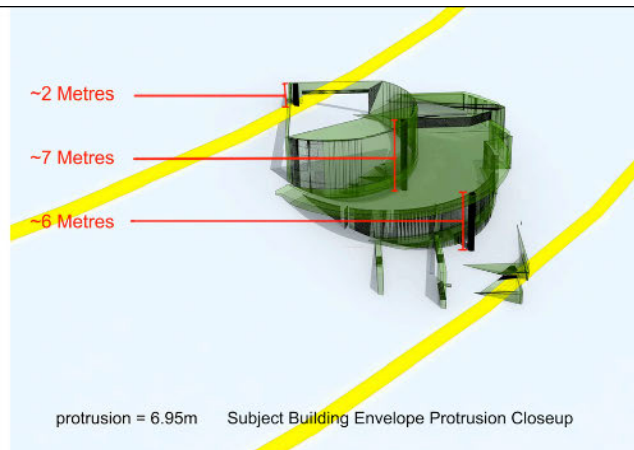


View loss – green = view gain / red = view loss

There are also several areas of assessment that can be used to resolve potential planning approval issues in the early stages of design. In the case below, the permissible building envelope in North Sydney CBD was modelled in 3d to determine if a building proposal would exceed the permitted height limit. Information relating to the amount of encroachment beyond the envelope allowed the architect to re-design the plant room profiles accordingly to avoid any breach.



3d model of planning height zones

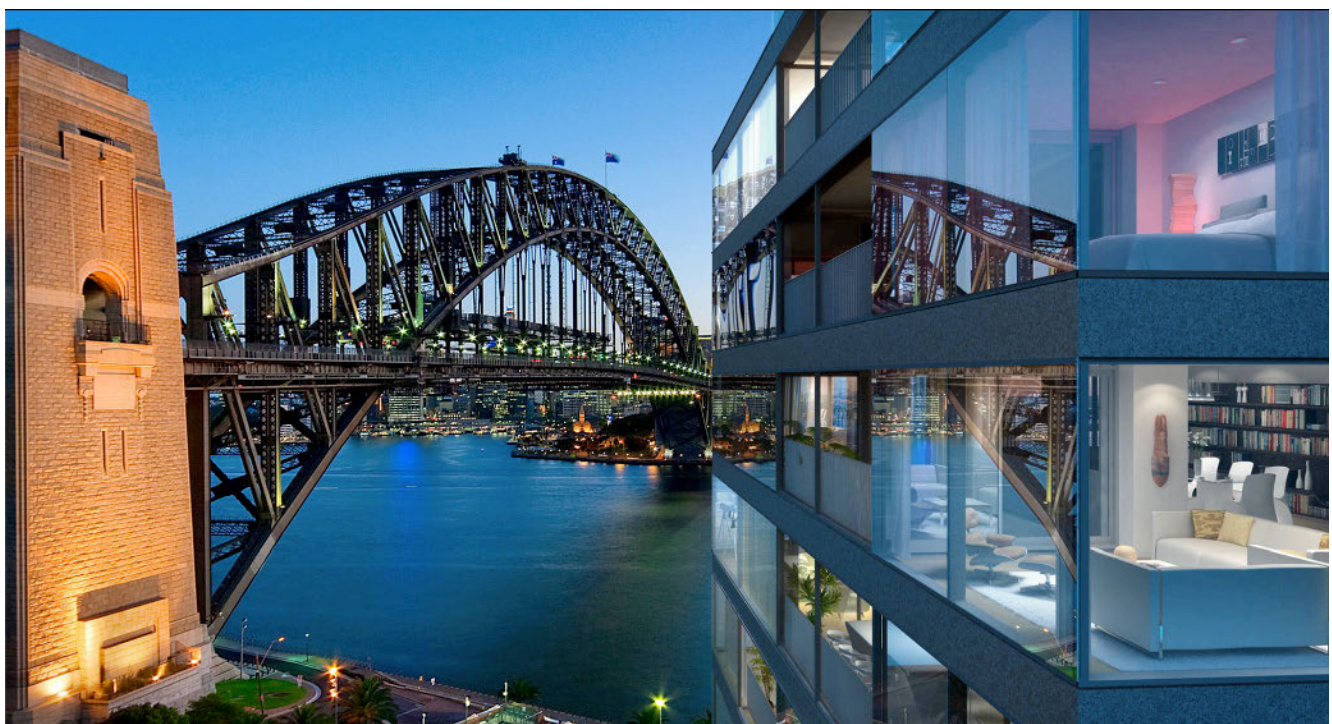


Extent of protrusion of proposed design prior to re-design

Urbaine's experience in this field has placed the company in a strong position to advise on the verification of imagery and also to assist in developing more robust methods of analysis of such imagery. As a minimum, Urbaine would suggest that anyone engaging the services of visualisation companies should request the following information, as a minimum requirement:

1. Height and plan location of camera to be verified and clearly shown on an aerial photo, along with the sun position at time of photography.
2. A minimum of 4 surveyed points identified in plan, at ground level relating to elements on the photograph and hence to the location of the superimposed building.
3. A minimum of 4 surveyed height points to locate the imposed building in the vertical plane.
4. A series of images to be prepared to explain each photomontaged view, in line with the above stages.

This is an absolute minimum from which a client can determine the verifiability of a photomontaged image. From this point the images can be assessed by other consultants and used to prepare a legal case for planning approval.



Verified photomontage for proposed apartments in Milsons Point by Urbaine.