

## Appendix B Consolidated mitigation measures of the Project

Table B-1 Consolidated mitigation measures of the Project

Changes since the exhibition of the EIS are shown in either ~~strikethrough~~ (for deletions) or **underline and bold** (for additions). Important changes are explained in footnotes.

| ID            | Mitigation measures   | Project stage        |
|---------------|---|----------------------|
| <b>Visual</b> |   |                      |
| <b>V1</b>     | <p><b>Control the level of lighting</b></p> <ul style="list-style-type: none"> <li>• Only use lighting for areas that require lighting i.e., paths building entry points.</li> <li>• Reduce the duration of lighting.                             <ul style="list-style-type: none"> <li>○ Switch off lighting when not required.</li> <li>○ Consider the use of sensors to activate lighting and timers to switch off lighting.</li> </ul> </li> <li>• Lighting at the construction compound would be designed and operated in accordance with AS/NZS 4282:2019 Control of the obtrusive effects of outdoor lighting.</li> </ul> | All Stages           |
| <b>V2</b>     | <p><b>Lighting design</b></p> <ul style="list-style-type: none"> <li>• Use the lowest intensity required for the job.</li> <li>• Use energy efficient bulbs and warm colours.</li> <li>• Direct light downwards.</li> <li>• Ensure lights are not directed at reflective surfaces.</li> <li>• Use non-reflective dark coloured surfaces to reduce reflection of lighting.</li> <li>• Keep lights close to the ground and or directed downwards.</li> <li>• Use light shield fittings to avoid light spill.</li> </ul>   | Design, Construction |
| <b>V3</b>     | <b>Glint and Glare</b>  | Design, construction |

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| ID                                       | Mitigation measures   | Project stage       |
|--|---|---------------------|
|  | <ul style="list-style-type: none"> <li>Control glare potential on Middlebrook Road either by operational tracking restrictions <b>and / or</b> supplementary vegetation screening (<b>refer to Draft Landscape Plan Appendix D.2</b>). This is restricted to Sept to mid-March (between 5:30am and 6:30am) and November to early February (between 6:30pm and 7:05pm).</li> </ul>   |                     |
| <b>Noise and vibration</b> <sup>16</sup> |   |                     |
| <b>NV1</b>                               | Establish a complaints procedure, including signage and other means to advertise the contact number regarding complaints. Respond to complaints in a timely manner and keep relevant parties informed of progress.  | All stages          |
| <b>NV2</b>                               | Develop noise management plan to ensure the following actions minimise noise: <ul style="list-style-type: none"> <li>All engine covers would be kept closed while equipment is operating.</li> <li>Where possible use less noisy plant and equipment.</li> <li>Provide special attention to the use and maintenance of ‘noise control’ or silencing kits fitted to machines to ensure they perform as intended.</li> <li>Plant and equipment should be properly maintained.</li> <li>Avoid any unnecessary noise when carrying out manual operations and when operating plant.</li> <li>Switch off plant when not in use.</li> <li>Trucks should not be left idling where possible.</li> <li>As far as possible, heights from which materials are dropped, into or out of trucks, would be minimised.</li> <li>Machines found to produce excessive noise compared to industry best practice would be removed from the site or stood down until repairs or modifications can be made.</li> <li><b><u>Good relations with people living and working in the vicinity of a construction site should be established at the beginning of a project and be maintained throughout the project, as this is of</u></b></li> </ul> | During construction |

<sup>16</sup> ~~Strikeout text~~ deletions and **bold text** additions reflect the updated noise and vibration assessment provided with the Amendment report (NGH 2024b).

| ID  | Mitigation measures   | Project stage                            |
|---|---|--|
|   | <p><b><u>paramount importance. Keeping people informed of progress and taking complaints seriously and dealing with them expeditiously is critical. The person selected to liaise with the community should be adequately trained and experienced in such matters.</u></b></p>  |  |
| <p><b>NV3</b></p>                                 | <p><b><u>Options such as respite periods will be discussed with affected receivers R10 and R29 regarding potential noise exceedances during Middlebrook Road upgrade works.</u></b></p>   | <p><b><u>During construction</u></b></p> |
| <p><b>Traffic and transport <sup>17</sup></b></p> |   |  |
| <p><b>T1</b></p>                                  | <p>A Construction Traffic Management Plan (CTMP) will be prepared and implemented. The following provisions will be included to minimise the impact of the proposal’s construction traffic as described in the Traffic Impact Assessment:</p> <ul style="list-style-type: none"> <li>• Prior to construction, a pre-condition survey of the relevant sections of the existing road network be undertaken, in consultation with Council. During construction the sections of the road network utilised by the proposal are to be monitored and maintained to ensure continued safe use by all road users, and any faults attributed to construction of the solar farm would be rectified. At the end of construction, a post-condition survey would be undertaken to ensure the road network is left in the consistent condition as at the start of construction.</li> <li>• Vehicles are recommended to drive at slower speeds when travelling on unsealed roads. This can reduce the amount of dust created and the amount of dirt tracked onto the public road network. Standard mitigation measures such as a water trucks to dampen the roads and reduce the amount of dust in the air, can also be considered to reduce dust levels.</li> <li>• Neighbours of the solar farm be consulted and notified regarding the construction program and peak periods.</li> <li>• The use of shuttle busses to minimise traffic during construction would be undertaken.</li> <li>• <b><u>Driver protocols</u></b></li> </ul> | <p>Prior to and during construction</p>  |

<sup>17</sup> ~~Strikeout text~~ deletions and **bold text** additions reflect the updated traffic impact assessment provided with the Amendment report (NGH 2024b).

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| ID                        | Mitigation measures   | Project stage                       |
|---------------------------|---|-------------------------------------|
|                           | <ul style="list-style-type: none"> <li>• <b><u>Car-pooling program as set out in the Traffic Impact Assessment (March 2024)</u></b></li> <li>• <b><u>On-site mitigation measures</u></b></li> </ul>   |                                     |
| T2                        | During periods of wet weather, contractor to liaise with Tamworth Regional Council in order to determine if Middlebrook Road is suitable to be utilised by B-Double vehicles as outlined within the TfNSW Restricted Vehicle Access Map.  | Construction                        |
| T3                        | Heavy vehicle movements should avoid peak school bus times to limit the interaction of larger vehicles and vulnerable road users. A school bus service is operated by Hannaford Bus along Middlebrook Road which passes the site at approximately 7:30am for the school pickup and 4:30pm for the drop-off service. | Construction                        |
| T4                        | Any OSOM vehicle movement are to be timed so that they do not coincide with other OSOM Vehicles within the surrounding area to limit the impact to the road network, which can be undertaken as part of the permit application.   | Construction                        |
| T5                        | <b><u>Upgrade and seal to 7m, the 3.8km of Middlebrook Road to comply with the ARRB Guide in order to allow two trucks to pass, to 150m beyond the first site access point.</u></b>   | <b><u>Prior to construction</u></b> |
| T5.1                      | <b><u>Upgrade to 7m (unsealed) between the first and second access points off Middlebrook Road, to comply with the ARRB Guide in order to allow two trucks to pass.</u></b>   | <b><u>Prior to construction</u></b> |
| T6                        | Single lane bridge on Middlebrook road requires a review of signage and line marking to ensure it is in accordance with the relevant standards and any deficiencies rectified. Structural weight capacity of the bridge is required to be assessed prior to any OSOM vehicle movements accessing the site.          | Prior to construction               |
| T7                        | Upgrade the intersection of New England Highway and Middlebrook Road to provide a BAL turn treatment. <b>In order to facilitate left-turn movements, amend the existing line marking and carry out localised widening as shown in updated Project description, Amendment report NGH 2024b.</b>                      | Prior to construction               |
| <b>Land compatibility</b> |   |                                     |

| ID                                | Mitigation measures  | Project stage   |
|-----------------------------------|--|---|
| LU1                               | <p>A Rehabilitation and Decommissioning Management Plan is to be prepared in consultation with NSW Department of Primary Industries prior to decommissioning. The Rehabilitation and Decommissioning Management Plan is to include:</p> <ul style="list-style-type: none"> <li>• Removal of all above ground infrastructure with the exception of TransGrid connection assets and substation.</li> <li>• Removal of all cabling to a maximum depth of 500 mm.</li> <li>• Verification that no adverse impact on land capability for the Disturbance footprint.</li> <li>• Verification of a safe, stable and non-polluting site.</li> </ul>  | Decommissioning   |
| <u>LU2</u> <sup>18</sup>          | <p><b><u>A Pest and Weed Management Plan would be prepared for the construction, operation and decommissioning stages, based on Tamworth Regional Council and NSW DPI requirements. Management measures would focus on early identification of invasive weeds and effective management controls. Identification and management of pest animals in line with LLS procedures. During operations, the Pest and Weed Management Plan would manage impacts associated with weeds such as the risk of weed ingress along the boundary of the development site and the importation and spread of weeds through vehicle movements. The plan would focus on weed control techniques including herbicide and grazing pressure. This may be incorporated into the Biodiversity Management Plan.</u></b></p> | <b><u>Construction, Operation and Decommissioning</u></b> |
| <b>Biodiversity</b> <sup>19</sup> |  |   |
| B1                                | <p>A Biodiversity Management Plan will be prepared to manage construction activities. It must include:</p> <p>Timing protocols:</p> <p>Construction works to avoid critical life cycle events such as breeding or nursing.</p>   | Construction  |

<sup>18</sup> **Bold text** addition reflects additional agency consultation with DPI Agriculture.

<sup>19</sup> ~~Strikeout text~~ deletions and **bold text** additions reflect the updated BDAR provided with the Amendment report (NGH 2024b).

| ID | Mitigation measures  | Project stage |
|----|--|---------------|
|    | <p>Where practicable, hollow-bearing trees would not be removed during breeding and hibernation season (June to January) to mitigate impacts. If clearing outside of this period cannot be achieved, pre-clearing surveys would be undertaken by an ecologist or suitably qualified person to ensure no impacts to fauna would occur.</p> <p>Clearing protocols (for pre-clearing surveys, daily surveys and staged clearing) must include:</p> <ul style="list-style-type: none"> <li>○ Presence of a trained ecological or licensed wildlife handler during clearing events where required.</li> <li>○ Pre-clearing checklist.</li> <li>○ Tree clearing procedure.</li> <li>○ Staged habitat removal.</li> <li>○ Relocation of habitat features (fallen timber, hollow logs) from within Development footprint to adjacent area for habitat enhancement.</li> <li>○ Approved clearing limits are clearly delineated with temporary fencing or similar prior to construction commencing.</li> <li>○ Vegetation to be retained is identified and protected from inadvertent damage and soil disturbance.</li> <li>○ Where clearing occurs adjacent to areas to be retained, chainsaws would be used rather than heavy machinery to minimise risk of unauthorised disturbance.</li> </ul> <p>Best practice measures for removal and disposal of vegetation.</p> <p>An unexpected threatened species finds procedure.</p> <p>No stockpiling or storage within dripline of any mature trees</p> <p>Noise management measures to reduce impacts of noise.</p> <p>Light management measures:</p> <ul style="list-style-type: none"> <li>○ Light shields or daily/seasonal timing of construction to reduce impacts of light spill.</li> <li>○ Direct lights away from vegetation.</li> </ul> <p>Dust management.</p> <p>Sediment erosion control measures.</p> <p>Hygiene protocols to prevent the spread of weeds or pathogens, including:</p> |               |

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| ID | Mitigation measures   | Project stage  |
|----|---|--|
|    | <ul style="list-style-type: none"> <li>○ A procedure to prevent and minimise the spread of weeds. This would include a management protocol for declared priority weeds under the <i>Biosecurity Act 2015</i> during and after construction</li> <li>○ Weed hygiene protocol in relation to plant, machinery, and fill.</li> </ul> <p>Rehabilitation of disturbed areas.</p>             |  |
| B2 | <p>Temporary fencing to protect significant environmental features including:<br/>Identified Squirrel Glider species habitat including fencing off the Subject Land boundary in the east.<br/>Buffer of riparian zone, drainage lines and farm dams to be retained.<br/>Karst/caves and rocks.</p>  | <p>Construction<br/>Operation<br/>Decommissioning</p>  |
| B3 | <p>Fencing design to control animal and vehicle interactions: Subject Land to be fenced entirely during construction and operation. <b><u>No fencing, either temporary or permanent is to contain barbed wire.</u></b></p>  | <p>Design</p>  |
| B4 | <p>Fencing / crossing location to limit impacts on connectivity at Banyandah Creek:</p> <ul style="list-style-type: none"> <li>○ No fencing across Banyandah Creek.</li> <li>○ Banyandah Creek crossing to allow passage of ground dwelling fauna underneath.</li> <li>○ <b><u>Fencing during construction and operation to control animal and vehicle interactions.</u></b></li> </ul> | <p>Design<br/><b><u>Construction</u></b><br/><b><u>Operation</u></b><br/><b><u>Decommissioning</u></b></p> |
| B5 | <p>Staff training and site briefing to communicate environmental features to be protected and measures to be implemented will include:</p> <p>Site induction<br/>Toolbox talks<br/>Site speed limits to be enforced to minimise fauna strike.</p>   | <p>Construction<br/>Operation<br/>Decommissioning</p>  |
| B6 | <p>The Project's offset obligation will be met in accordance with the NSW Biodiversity Offsets Scheme (BOS), and will be achieved by either:</p> <ul style="list-style-type: none"> <li>• Retiring credits under the Biodiversity Offsets Scheme based on the like-for-like rules, or</li> </ul>  | <p>Prior to construction</p>   |

| ID | Mitigation measures   | Project stage                                   |
|----|---|---|
|    | <ul style="list-style-type: none"> <li>• Making payments into the Biodiversity Conservation Fund using the offset payments calculator, or</li> <li>• Funding a biodiversity action that benefits the threaten entities impacted by the development.</li> </ul> <p><b><u>Consideration will be given to securing offsets locally, where practical.</u></b></p>   |   |
| B7 | <p>No solar panels would be constructed in any Box Gum Woodland remnants with vegetation integrity score of over 30. In these higher condition remnants only infrastructure than cannot be relocated would be allowed; access ways, fences and water way crossings.</p>   | Design  |
| B8 | <p>Middlebrook Road, for the 3.8km from New England Highway to the site access, would be surveyed subject to final upgrade designs to confirm (or update) biodiversity assessment assumptions that it can be excluded from assessment and offsets.</p>  | Prior to approval                               |
| B8 | <p><b><u>Following guidelines will be implemented during vegetation clearing:</u></b></p> <ul style="list-style-type: none"> <li>• <b><u>Clearing activities will be timed to avoid critical life cycle events, such as breeding and nursing. There will be instigation of clearing protocols to include pre-clearing surveys, daily surveys and staged clearing, the presence of a trained ecological or licensed trained spotter catcher during clearing events.</u></b></li> <li>• <b><u>There will be relocation of habitat features (fallen timber, hollow logs, and embedded rock) from within the Development Footprint to provide supplementary habitat for displaced fauna.</u></b></li> <li>• <b><u>Clearing will be staged and supervised by Ecologist or trained spotter catcher to allow for resident fauna to relocate or be relocated where required.</u></b></li> </ul> | <b><u>Pre-construction and construction</u></b> |
| B9 | <p><b><u>Adoption of clearing protocols that identify vegetation to be retained, prevent inadvertent damage, and reduce soil disturbance, including:</u></b></p> <ul style="list-style-type: none"> <li>• <b><u>Chainsaw to be used over heavy machinery to remove native vegetation for partial clearing where possible.</u></b></li> <li>• <b><u>Using noise barriers, or daily/seasonal timing of construction and operational activities to reduce impacts of noise,</u></b></li> </ul>   | <b><u>Pre-construction and construction</u></b> |

| ID                                       | Mitigation measures  | Project stage                   |
|--|--|---------------------------------|
|  | <ul style="list-style-type: none"> <li>• <u>Using light shields, or daily/seasonal timing of construction and operational activities to reduce impacts of light spill,</u></li> <li>• <u>Using adaptive dust management and monitoring programs to control air quality,</u></li> <li>• <u>Scheduling the timing of construction activities to avoid impacts (e.g. timing the construction for when migratory species are not at the site, or when particular species known to, or likely to use the habitat on the site, are not breeding or nesting),</u></li> <li>• <u>Erecting temporary fencing to protect significant environmental features, such as riparian zones,</u></li> <li>• <u>Using hygiene protocols to prevent the spread of weeds or pathogens between infected and uninfected areas,</u></li> <li>• <u>Training staff and conducting site briefings to communicate environmental features to be protected and measures to be implemented,</u></li> <li>• <u>Preparing a vegetation management plan to regulate activity in vegetation and habitats adjacent to residential developments. The plan may include controls on pet ownership, rubbish disposal, wood collection, fire management, and disturbance to nests and other niche habitats, and</u></li> <li>• <u>Providing for the ecological restoration, rehabilitation and/or ongoing maintenance of retained native vegetation habitat on, or adjacent to, the development or clearing site or land to be biodiversity certified.</u></li> </ul> |                                 |
| <b>Aboriginal Heritage</b> <sup>20</sup> |  |                                 |
| <b>AH1</b>                               | The development must avoid the two possible modified trees (Middlebrook SF Modified Tree 1 & 2). A minimum 20m buffer would be in place around each of the possible-modified trees to prevent any inadvertent impacts to <b><u>the trunks,</u></b> canopy and/or root system.  | Prior to construction - ongoing |

<sup>20</sup> ~~Strikeout text~~ deletions and **bold text** additions reflect the updated ACHA provided with the Amendment report (NGH 2024b).

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| ID           | Mitigation measures  | Project stage                                 |
|--------------|--|---|
| <b>AH1.1</b> | <b><u>The development avoids the area of archaeological sensitivity around Spring Creek as shown the updated ACHA Final V2 (Appendix H, NGH 2024b)</u></b>   | <b><u>Prior to construction - ongoing</u></b> |
| <b>AH2</b>   | <p>Where they can be avoided, a minimum 5m buffer should be observed by the Project around all stone artefact sites recorded.</p> <p>If complete avoidance to any of the isolated finds and/or artefact scatters recorded within areas to be impacted is not possible, a reasonable attempt to collect the surface stone artefacts <b><u>recorded within the development footprint must occur following the development consent which is issued for State Significance Developments in NSW, prior to the proposed construction works commencing for the Middlebrook Solar Farm.</u></b></p> <p>Until surface collection salvage has occurred a minimum 5m buffer must be observed around each stone artefact site.</p> | Prior to construction - ongoing               |
| <b>AH3</b>   | The collection and relocation of the surface artefacts <b><u>must</u></b> be undertaken by an archaeologist with representatives of the registered Aboriginal parties, as selected by the Applicant, and be consistent with Requirement 26 of the <i>Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales</i> .  | During construction - ongoing                 |
| <b>AH4</b>   | All objects salvaged must have their burial location submitted to the AHIMS database. An Aboriginal Site Impact Recording Form must be completed and submitted to AHIMS following harm for each site collected or destroyed from salvage and/or construction works as approved for impacts in line the development consent for this State Significant Development.   | Prior to construction - ongoing               |
| <b>AH5</b>   | A Cultural Smoking Ceremony would take place to cleanse any artefacts salvaged and the burial location, as requested by the Aboriginal community.  | Prior to construction - ongoing               |
| <b>AH5.1</b> | <b><u>A minimum 5m buffer should be observed around all stone artefact sites that are being avoided by the proposed development.</u></b>   | <b><u>Prior to construction - ongoing</u></b> |
| <b>AH6</b>   | Unmitigated impacts may only occur post development consent at the previously recorded AHIMS site Kiah Creek ISO 1 (AHIMS# 29-2-0263).   | During construction - ongoing                 |

| ID           | Mitigation measures  | Project stage                        |
|--------------|--|--------------------------------------|
| AH7          | Additional assessment and Aboriginal consultation would be required in any areas required to be impacted outside the assessed Development footprint. Specifically, Middlebrook Road, for the 3.8km from New England Highway to the site access, would be surveyed subject to final upgrade designs to confirm (or update) heritage assessment assumptions that it can be excluded from assessment.   | During construction -- ongoing       |
| <b>AH7</b>   | <b><u>All works for the Middlebrook Solar Farm must stay within the area assessed for construction and access works as detailed in the updated ACHA Final V2 (Appendix H, NGH 2024b) to ensure there are no inadvertent impacts to Aboriginal objects.</u></b>   | <b>During construction - ongoing</b> |
| <b>AH7.1</b> | <b><u>For any proposed future impacts to additional sites and/or the area of archaeological sensitivity currently being avoided by this project, including areas outside those assessed for the Middlebrook Solar Farm as assessed in this report, further assessment and consideration of impacts on Aboriginal Heritage as determined by an archaeologist should occur. Additional Aboriginal consultation and further assessment which may include survey and/or subsurface testing may be required.</u></b>  | <b>During construction - ongoing</b> |
| AH8          | The Applicant should prepare a Cultural Heritage Management Plan (CHMP) to address the potential for finding additional Aboriginal artefacts during the construction of the Middlebrook Solar Farm and for the management of known sites, artefacts and the archaeologically sensitive area within the Proposal Area. The Plan should include the unexpected finds procedure to manage any objects suspected to be Aboriginal in origin during the construction, maintenance, operational and decommissioning works and include requirements for heritage to be included as part of the site inductions, the monitoring of sites which will be avoided and a methodology for surface collection. Preparation of the CHMP should be undertaken in consultation with the registered Aboriginal parties. <b><u>A draft unexpended finds procedure is provided in Appendix F of the updated ACAH V2.</u></b> | During construction - ongoing        |
| AH9          | In the unlikely event that human remains are discovered during the construction of the Middlebrook Solar Farm, all work must cease in the immediate vicinity. The appropriate heritage team within Heritage NSW and the local police should be notified. Further assessment would be undertaken to determine if the remains were Aboriginal or non-Aboriginal. If the remains are deemed to be Aboriginal in origin Heritage NSW would be sought to advise the Proponent on the appropriate actions required.  | During construction - ongoing        |

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| ID                         | Mitigation measures  | Project stage                               |
|----------------------------|--|---|
| AH10                       | Prior to any development consent being issued for this project the drafted conditions which relate to Aboriginal heritage should be reviewed by a qualified archaeologist.   | Prior to Construction                       |
| <b>Historic heritage</b>   |  |   |
| HH 1                       | In the unlikely event that an item of historic heritage is identified, the Heritage NSW must be contacted prior to further work being carried out in the vicinity.   | Construction, operation and decommissioning |
| HH 2                       | Any additions or changes to the scope not outlined within this report may require additional heritage assessment.  | Construction, operation and decommissioning |
| <b>Social and Economic</b> |  |   |
| SE 1                       | <p>The Community and Stakeholder Engagement Strategy will be updated in accordance with the recommendations of the Social Impact Assessment, Appendix D.6 of the exhibited EIS (final V1.1 26/06/2023, NGH 2023). This will include:</p> <ul style="list-style-type: none"> <li>• More meaningful and in-depth engagement with near neighbours.</li> <li>• More inclusion of the broader Loomberah community.</li> <li>• Ground-truth and further develop the draft Community Benefit Fund framework.</li> <li>• Develop the Industry Participation Plan.</li> <li>• Strong engagement about the construction phase.</li> <li>• Engage in broader social/economic development planning.</li> <li>• Evaluate engagement effectiveness.</li> </ul> | Prior to construction                       |
| SE 2                       | <p>Develop an Industry Participation Plan in accordance with the recommendations of the Social Impact Assessment, provided with the EIS. This will include:</p> <ul style="list-style-type: none"> <li>• Consideration of local employment and procurement, as well as the accommodation of the non-resident construction workforce.</li> </ul>  | Prior to construction                       |

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| ID                               | Mitigation measures   | Project stage         |
|----------------------------------|---|-----------------------|
|                                  | <ul style="list-style-type: none"> <li>Targeted towards the people and businesses within Tamworth LGA, as well as giving consideration to the wider New England region.</li> <li>Specific opportunities for Aboriginal people and businesses, women, and young people.</li> <li>A Local Procurement Policy.</li> <li>An Accommodation and Employment Strategy.</li> </ul>   |                       |
| SE 3                             | <p>Develop a model of Community Benefit Sharing comprising a:</p> <ul style="list-style-type: none"> <li>Community Benefit Fund</li> <li>Neighbouring Benefit Fund</li> </ul> <p>in accordance with the recommendations of the Social Impact Assessment of the exhibited EIS (final V1.1 26/06/2023, NGH 2023). The model will ensure benefits of the project are shared with the community in a way that adds value to the local area and enhances the social and economic outcomes.</p> | Prior to construction |
| SE 4 <sup>21</sup>               | <p><b><u>Security cameras would be directed to record only the Project site and ensure they do not capture offsite areas as much as practical.</u></b></p>  | <b><u>Design</u></b>  |
| <b>BESS Hazard <sup>22</sup></b> |   |                       |
| H1                               | <p>Controls set out the Preliminary Hazards Analysis hazards register (Table 5-4 in the <b><u>Rev 4.6 of the Preliminary Hazards Analysis, Pando Consulting, March 2024</u></b>) will be implemented throughout all stages of the Project. This is reproduced at the end of this table.</p>   | All stages            |
| H2                               | <p>The results of the PHA will be included in a Project specific:</p>   | All stages            |

<sup>21</sup> **Bold text** addition reflects community feedback received during the submissions stage.

<sup>22</sup> ~~Strikeout text~~ deletions and **bold text** additions reflect the updated PHA provided with the Amendment report (NGH 2024b).

| ID | Mitigation measures  | Project stage        |
|----|--|----------------------|
|    | <ul style="list-style-type: none"> <li>• Bushfire Emergency Management and Operations Plan.</li> <li>• Fire Management Plan - <b>in consultation with NSW RFS Tamworth Fire Control Centre, including:</b> <ul style="list-style-type: none"> <li>○ <b>24 hour emergency contact details including alternative telephone contact;</b></li> <li>○ <b>Site infrastructure plan;</b></li> <li>○ <b>Fire fighting operations plan including methods and resources to manage and extinguish Lithium Battery Fires.</b></li> </ul> </li> <li>• Emergency Response Plan.</li> <li>• Fire Safety <b>Study</b></li> </ul> |                      |
| H3 | Following a decision of the BESS Original Equipment Manufacturer, the detailed design of the BESS will be undertaken to comply with the requirements of Section 3.2 of the PHA, including separation distances, UL9540A test reports and OEM recommendations.  | Design               |
| H4 | If the Proponent chooses to use the Tesla Megapack, all recommendations from the Victorian Big Battery Fire Statement of Technical Findings – Victorian Government 2021 will be implemented.   | Design               |
| H5 | The distributed BESS are required to be located within proximity of the solar arrays to reduce the development footprint and increase the financial feasibility of the project.  | Design               |
| H6 | The separation distances and distances to nearby receivers described in the PHA will be maintained to further reduce the fire risks from the BESS.   | Design, Construction |
| H7 | Rack separation would be subject to compliance with UL9540A.   | Design, All stages   |
| H8 | Battery to battery clearance as per table 3.3 Appendix NPFA 855 14.2.2 states Containers must be 0.9m from other battery collection containers and combustible materials.  | Design, All stages   |

| ID                                  | Mitigation measures   | Project stage                            |
|-------------------------------------|---|--|
| H9                                  | Power conversion Unit would maintain Minimum of 900mm distance between battery system and Power Conversion Equipment as per ASNZS 5139.2019 6.2.6.2   | Design, All stages                       |
| H10                                 | DC/DC Converter Minimum of 900mm distance between battery system and Power Conversion Equipment as per ASNZS 5139.2019 6.2.6.2  | Design, All stages                       |
| <b>Electric and magnetic fields</b> |   |  |
| E1                                  | All electrical equipment will be designed in accordance with relevant codes and industry best practice standards in Australia.  | Design                                   |
| E2                                  | All design and engineering will be undertaken by qualified and competent person/s with the support of specialists as required.  | Design                                   |
| E3                                  | Design of electrical infrastructure will minimise EMFs.   | Design                                   |
| <b>Bush fire <sup>23</sup></b>      |   |  |
| BF1                                 | Dangerous or hazardous materials would be stored and handled in accordance with AS1940-2004: <i>The storage and handling of flammable and combustible liquids</i> <b>as well as the requirements of all other relevant Australian Standards and the NSW EPA's <i>Storing and Handling of Liquids: Environmental Protection - Participants Handbook</i> if the chemicals are liquids, whichever is more stringent.</b> | Construction/ operation/ decommissioning |
| BF2                                 | Develop a Bush Fire Emergency Management and Operations Plan to include but not be limited to: <ul style="list-style-type: none"> <li>Detailed measures to prevent or mitigate fires igniting.</li> </ul>   | Construction/ operation/ decommissioning |

<sup>23</sup> **Bold text** additions reflect the submission from DPE Hazards.

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| ID  | Mitigation measures  | Project stage           |
|-----|--|-------------------------|
|     | <ul style="list-style-type: none"> <li>• Work that should not be carried out during total fire bans.</li> <li>• Availability of fire-suppression equipment, access and water.</li> <li>• Storage and maintenance of fuels and other flammable materials.</li> <li>• Notification of the local NSW RFS Fire Control Centre for any works that have the potential to ignite surrounding vegetation, proposed to be carried out during a bush-fire fire danger period to ensure weather conditions are appropriate.</li> <li>• Appropriate bush fire emergency management planning.</li> </ul> <p>In developing the BFEMOP, NSW RFS and FRNSW would be consulted on the volume of water supplies, fire-fighting equipment maintained on-site, fire truck connectivity requirements, proposed APZ and access arrangements, communications, vegetation fuel levels and hazard reduction measures.</p> |                         |
| BF3 | <ul style="list-style-type: none"> <li>• An APZ of minimum 10m would be maintained between remnant or planted woody vegetation and solar farm infrastructure.</li> <li>• Average grass height within the APZ would be maintained at or below 5cm on average throughout the November to February fire season. Average grass height outside the APZ, including beneath the solar array, would be maintained at or below 10cm throughout the fire season.</li> <li>• <b><u>The APZ must be maintained to the standard of an inner protection area for the life of the development (to the specifications identified in Appendix 4 of PBP).</u></b></li> </ul>   | Construction/ operation |
| BF4 | <p>Non-combustible (steel or concrete) water storage tanks should be installed adjoining the main internal access road, or nearby the BESS, for fire-fighting and other non-potable water uses, with a 65mm Storz outlet, a metal valve and a minimum of 20,000 litres reserved for fire-fighting purposes, in accordance with PBP. The final location/s of water tanks will be determined in agreement with NSW RFS and FRNSW recommendations.</p>  | Construction            |
| BF5 | <p>Appropriate fire-fighting equipment would be held on site to respond to any fires that may occur at the site during construction. This equipment would include fire extinguishers, a 1000 litre water cart (fitted with suitable hosing, fittings and diesel firefighting pump) retained on site on a precautionary basis, particularly during any blasting and welding operations. Equipment lists would be detailed in Work Method Statements.</p>  | Construction            |

## Submission report

Middlebrook solar farm



| ID   | Mitigation measures  | Project stage                            |
|------|--|--|
| BF6  | The NSW RFS and Fire and Rescue NSW would be provided with a contact point for the solar farm, during construction and operation.  | Construction/ operation                  |
| BF7  | Following commissioning of the solar farm, the local NSW RFS and Fire and Rescue brigades would be invited to an information and orientation day covering access, infrastructure, firefighting resources on-site, fire control strategies and risks/hazards at the site.   | Operation                                |
| BF8  | The perimeter access track would comply with the requirements of property access roads in accordance with Table 5.3b of the PBP. All access and egress tracks on the site would be maintained and kept free of parked vehicles to enable rapid response for firefighting crews and to avoid entrapment of staff in the case of bush fire emergencies. Access tracks would be constructed as through roads as far as practicable. Dead end tracks would be signposted and include provision for turning firefighting vehicles.  | Construction/ operation/ decommissioning |
| BF9  | A Hot Works Permit system would be applied to ensure that adequate safety measures are in place. Fire extinguishers would be present during all hot works. Where practicable hot works would be carried out in specific safe areas (such as the Construction Compound temporary workshop areas).   | Construction/ operation/ decommissioning |
| BF10 | Machinery capable of causing an ignition would not be used during bushfire danger weather, including Total Fire Ban days.  | Construction/ operation/ decommissioning |
| BF11 | <p>Prior to operation of the solar farm, an Emergency Response Plan (ERP) would be prepared in consultation with Council, the RFS and Fire and Rescue NSW. This plan must include but not be limited to:</p> <ul style="list-style-type: none"> <li>• Specifically addresses foreseeable on-site and off-site fire events and other emergency incidents.</li> <li>• Risk control measures would include the level of personal protective clothing required to be worn, the minimum level of respiratory protection required, decontamination procedures, minimum evacuation zone distances and a safe method of shutting down and isolating the PV system (either in its entirety or partially, as determined by risk assessment).</li> <li>• Outline other risk control measures that may need to be implemented in a fire emergency due to any unique hazards specific to the site.</li> </ul> | Operation                                |

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| ID          | Mitigation measures   | Project stage     |
|-------------|---|-------------------|
|             | <ul style="list-style-type: none"> <li>Two copies of the ERP are stored in a prominent 'Emergency Information Cabinet' which is located in a position directly adjacent to the site's main entry point/s.</li> <li>Once constructed and prior to operation, the operator of the facility would contact the relevant local emergency management committee.</li> </ul>  |                   |
| <b>BF12</b> | <p>Prior to commissioning the solar farm, in consultation with Fire and Rescue NSW, develop:</p> <ul style="list-style-type: none"> <li>Fire Safety Study developed in accordance with the requirements of Hazardous Industry Planning Advisory Paper (HIPAP) No.21 and is to meet the operational requirements of FRNSW. It must consider the operational capability of local fire agencies and the need for the facility to achieve an adequate level of on-site fire and life safety independence. The FSS should consider worst-case fire scenarios including a full BESS unit fire and demonstrate no fire propagation within the facility. It is required to include an Initial Fire Safety Report (IFSR) and / or Performance-Based Design Brief / Fire Engineering Brief Questionnaire (FEBQ).</li> <li>A comprehensive Emergency Response Plan (ERP) for the site in accordance with HIPAP No.12.</li> <li>An Emergency Services Information Package (ESIP) in accordance with FRNSW fire safety guideline – Emergency services information package and tactical fire plans.</li> <li>An Emergency Responders Induction Package for the site.</li> </ul> | Pre-commissioning |
| <b>BF13</b> | <p>Fire risks associated with the lithium-ion energy storage facility would include:</p> <ul style="list-style-type: none"> <li>Locating the BESS as far as practicable from any sensitive receptors or large stands of vegetation.</li> <li>Installing reliable automated monitoring (voltage and temperature), alarm and shutdown response systems.</li> <li>Installing reliable integrated fire detection and fire suppression systems (inert gas).</li> <li>Ensuring the battery containers are not vulnerable to external heat effects in the event of a bush fire.</li> <li>Designing appropriate separation and isolation between battery containers and between batteries and other infrastructure, including gravel surfacing around the facility for a minimum 10m in accordance with APZ.</li> <li>Compliance with all relevant guidelines and standards.</li> </ul>   | Design            |

| ID                            | Mitigation measures   | Project stage |
|-------------------------------|---|---------------|
|                               | <ul style="list-style-type: none"> <li>Preparation of a specific Battery Fire Response Plan, under the general BFEMOP, in consultation with fire authorities, fire suppression experts and in reference to relevant standards and guidelines.</li> <li>Facilitation of first responder training in the management of Lithium-ion battery fires at the site for local brigades.</li> </ul>   |               |
| <b>Hydrology and flooding</b> |   |               |
| <b>W1</b>                     | <p>Buildings and structures</p> <ul style="list-style-type: none"> <li>Located outside high Hazard areas (H5 and above).</li> <li>Finished floor level of all buildings would be a minimum 500mm above the 1%AEP flood level.</li> <li>Drainage works at and around the proposed substation site to manage and divert upslope flows around the area to ensure it remains free of flooding up to the PMF event.</li> </ul> <p>Solar panel modules</p> <ul style="list-style-type: none"> <li>The tracking axis located above the 1%AEP flood level plus 500mm freeboard, and the modules rotated to the horizontal during significant flood events to provide maximum clearance to the predicted flood level.</li> <li>Where located in the floodplain the solar array mounting piers designed to withstand the forces of floodwater (including any potential debris loading) up to the 1% AEP flood event, giving regard to the depth and velocity of floodwaters.</li> </ul> <p>Electrical infrastructure</p> <ul style="list-style-type: none"> <li>All electrical infrastructure including power conversion stations and substation located above the 1% AEP flood level <b>plus</b> minimum 500mm freeboard.</li> </ul> <p>Perimeter fencing</p> <ul style="list-style-type: none"> <li>Avoid/minimise security fencing in floodplain.</li> <li>If required, security fencing should be constructed to minimise the effect of flow of the floodwater and be designed to withstand the forces of floodwater or collapse in a controlled manner to prevent impediment to floodwater.</li> </ul> | Design        |

| ID               | Mitigation measures  | Project stage |
|------------------|--|---------------|
|                  | <ul style="list-style-type: none"> <li>Any fencing across Banyandah Creek should be avoided in preference to creating separate fenced compounds on either side of the creek.</li> </ul> <p>Works in waterways</p> <ul style="list-style-type: none"> <li>Flood warning signs and flood level indicators placed on each approach to the proposed crossings.</li> <li>A Business Floodsafe Plan be prepared for the development to ensure the safety of employees during flood events in general accordance with the NSW SES “Business Floodsafe Toolkit and Plan”.</li> <li>Crossings designed to minimise any hydraulic impact in accord with Laying Pipes and Cable in Watercourses on Waterfront Land (DPE, 2022).</li> <li>Crossings designed in accordance with Guidelines for Watercourse Crossings on Waterfront Land (DPIE, 2022).</li> </ul> <p>Access roads</p> <ul style="list-style-type: none"> <li>Floodplain – keep as close to natural ground levels as possible.</li> <li>Surface treatment – give regard to velocity of floodwaters to minimise potential for souring during flood events.</li> </ul> |               |
| W2 <sup>24</sup> | <p>Works in waterways:</p> <ul style="list-style-type: none"> <li><b><u>Designed to minimise any hydraulic impact in accord with Laying Pipes and Cable in Watercourses on Waterfront Land</u></b> (DPE, 2022).<sub>2</sub></li> <li><b><u>Crossings designed in accordance with:</u></b> <ul style="list-style-type: none"> <li><b><u>Guidelines for Watercourse Crossings on Waterfront Land</u></b> (DPIE, 2022).<sub>2</sub></li> <li><b><u>Why do fish need to cross the road? Fish Passage Requirements for Waterway Crossings</u></b> (DPI (Fisheries), 2003).<sub>2</sub></li> <li><b><u>Policy and Guidelines for Fish Friendly Waterway Crossings</u></b> (DPI, 2013).<sub>2</sub></li> </ul> </li> </ul>  | Design        |

<sup>24</sup> **Bold text** additions reflect the submission received from DPI Water.

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| ID                                 | Mitigation measures   | Project stage                                |
|------------------------------------|---|--|
| <b>Water use and water quality</b> |   |  |
| W2                                 | All staff would be appropriately trained through toolbox talks for the minimisation and management of accidental chemical (e.g., fuel) spills.  | Prior to construction                        |
| W3                                 | All fuels, chemicals, and liquids would be stored at least 50m away from any drainage lines and would be stored in an impervious bunded area.   | Pre-construction<br>Construction             |
| W4                                 | <p>All chemicals and fuels used on-site must be stored and handled in accordance with:</p> <p>The requirements of all relevant Australian Standards.</p> <p>The NSW EPA's <i>Storing and Handling of Liquids: Environmental Protection – Participants Handbook</i> if the chemicals are liquids.</p> <p>In the event of an inconsistency, the most stringent requirement must prevail to the extent of the inconsistency.</p> | All stages                                   |
| W5                                 | Adequate incident management procedures would be incorporated into the Construction and Operation Environmental Management Plans, including requirement to notify EPA for incidents that cause material harm to the environment (refer s147-153 POEO Act).  | Construction<br>Operation<br>Decommissioning |
| W6                                 | The refuelling of plant and maintenance of machinery would be undertaken in impervious bunded areas and at least 50m away from any drainage lines.  | Pre-construction<br>Construction             |
| W7                                 | Machinery would be checked daily to ensure there is no oil, fuel or other liquids leaking from the machinery.   | Pre-construction                             |
| W8                                 | Ensure appropriate operational drainage controls are incorporated into the design.  | Design                                       |
| W9                                 | Potable and non-potable water will remain separated in transit to the site  | All stages                                   |

| ID                        | Mitigation measures  | Project stage |
|---------------------------|--|---------------|
| <b>Soil</b> <sup>25</sup> |  |               |
| <b>SO1</b>                | <p>A Soil and Water Management Plan (SWMP) including site specific Erosion and Sediment Controls would be prepared, implemented and monitored during the construction of the proposal, to minimise soil and water impacts. The SWMP would be prepared in accordance with the ‘Blue Book’ Volume 1 Managing Urban Stormwater: Soils and Construction (Landcom 2004) and include:</p> <ul style="list-style-type: none"> <li>• At the commencement of the works, and progressively during construction, install the required erosion control and sediment capture measures.</li> <li>• Regularly inspect erosion and sediment controls, particularly following rainfall.</li> <li>• Maintain a register of inspection and maintenance of erosion control and sediment capture measures.</li> <li>• Ensure that machinery leaves the site in a clean condition to avoid tracking sediment onto public roads.</li> <li>• In all excavation activities, separate subsoils and topsoils and ensure that they are replaced in their natural configuration to assist revegetation.</li> <li>• Stockpile topsoil appropriately to minimise weed infestation, maintain soil organic matter, and maintain soil structure and microbial activity.</li> <li>• Manage works in consideration of heavy rainfall events.</li> <li>• Areas of disturbed soil would be rehabilitated promptly and progressively during construction.</li> <li>• Spill procedure.</li> <li>• Unexpected, contaminated finds procedure.</li> </ul> | Construction  |
| <b>SO2</b>                | <p>Best practice management measures should be employed where applicable to reduce the risk of erosion and sedimentation control:</p> <ul style="list-style-type: none"> <li>• Preserve and stabilise disturbed areas, drainageways and steep slopes.</li> </ul>   | Construction  |

<sup>25</sup> **Bold text** additions reflect the submission received from DPI Agriculture.

| ID                | Mitigation measures  | Project stage      |
|-------------------|--|--------------------|
|                   | <ul style="list-style-type: none"> <li>• Minimise the extent and duration of disturbance.</li> <li>• Install perimeter controls.</li> <li>• Employ the use of sediment control measures to prevent off- and on-site damage.</li> <li>• Control stormwater flows onto, through and from the site in stable drainage structures.</li> </ul>  |                    |
| <p><b>SO3</b></p> | <p>A Groundcover Management Plan developed in consultation with a soil scientist and an agronomist would take into account soil survey results to ensure perennial grass cover is established across the site as soon as practicable and maintained throughout the operation phase. The Groundcover Management Plan would cover:</p> <ul style="list-style-type: none"> <li>• Soil restoration and preparation requirements.</li> <li>• Species selection.</li> <li>• Soil preparation.</li> <li>• Establishment techniques.</li> <li>• Maintenance requirements.</li> <li>• Perennial groundcover targets, indicators, condition monitoring, reporting and evaluation arrangements:                             <ul style="list-style-type: none"> <li>○ Live grass cover would be maintained at or above 70% to protect soils, landscape function and water quality.</li> <li>○ Any grazing stock would be removed from the site when cover falls below this level.</li> <li>○ Grass cover would be monitored using an accepted methodology.</li> </ul> </li> <li>• Contingency measures to respond to declining soil or groundcover condition.</li> <li>• Identification of baseline conditions for rehabilitation following decommissioning.</li> </ul> <p><b><u>Where grazing is proposed as part of this plan, the plan would be developed in consultation with NSW Local Land Services.</u></b></p> <p><b><u>A Holistic Grazing Management Plan would be developed in consultation with NSW Local Land Services</u></b></p> | <p>Operational</p> |
| <p><b>SO4</b></p> | <p>The array would be designed to allow sufficient space between panels to establish and maintain groundcover beneath the panels and facilitate weed control.</p>  | <p>Design</p>      |

| ID                             | Mitigation measures   | Project stage                       |
|--------------------------------|---|-------------------------------------|
| SO5                            | Wet weather contingency planning would be undertaken to protect soils from compaction.  | Construction                        |
| SO6                            | <p><b><u>Additional soil surveys and Land and Soil Capability mapping will be undertaken to inform remediation treatments during construction and operational management of the Project. Specifically, it will verify the transition zone between BSAL and Class 4 land, and remediation treatments for soil management during construction and operation of the Project. The soil survey will use a test pitting program to describe the soil profiles and sample soils. Samples will be sent away for laboratory analysis. The data collected will be analysed for LSC verification. The soil survey will be carried out in accordance with the following guidelines:</u></b></p> <ul style="list-style-type: none"> <li>• <b><u>Australian Soil and Land Survey Field Handbook</u></b> (CSIRO, 2009)</li> <li>• <b><u>Australian Soil Classification</u></b> (Isbell, 1996)</li> <li>• <b><u>Guidelines for Surveying soil and Land Resources</u></b> (CSIRO, 2008)</li> </ul> | <b><u>Prior to Construction</u></b> |
| <b>Air quality and climate</b> |   |                                     |
| A1                             | <p>Management protocols will include measures to minimise impacts on air quality including:</p> <ul style="list-style-type: none"> <li>• Identification of high-risk construction activities with potential to generate dust, and control measures for the activities.</li> <li>• A process for monitoring dust on-site and weather conditions, as well as procedures for altering management measures where required.</li> <li>• A map identifying locations of sensitive receivers.</li> <li>• Notification of relevant stakeholders to hours of work and duration of work.</li> <li>• An accessible complaints process with a timely response protocol.</li> </ul>   | All stages                          |
| A3                             | Dust generation by vehicles accessing the site and earthworks at the site will be suppressed using water applications or other means as required, using visual cues and in response to complaints.  | Construction/ decommissioning       |
| A4                             | Stockpiles will be covered or stored in areas not subject to high winds, and vehicle loads of material which may create dust would be covered while using the public road system.   | Construction/ decommissioning       |

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| ID                                       | Mitigation measures  | Project stage                            |
|--|--|--|
| A5                                       | All vehicles and machinery used at the site will be in good condition, fitted with appropriate emission controls and comply with the requirements of the POEO Act, relevant Australian standards and manufacturer's operating recommendations. Plant will be operated efficiently and turned off when not in use.  | All stages                               |
| A6                                       | Fires and material burning is prohibited on the Solar Farm site.   | All stages                               |
| A7                                       | Works that disturb vegetation, soil or stockpiles will not be carried out during strong winds (over 40 km/h).  | Construction                             |
| A8                                       | The use of renewable fuels/power sources for construction will be investigated and implemented where appropriate.  | Construction                             |
| A9                                       | Materials will be delivered as full loads, and local suppliers utilised where possible, to minimise haulage emissions.   | Construction                             |
| <b>Resource use and waste generation</b> |  |  |
| R1                                       | With the exception of permanent assets agreed by the landowners to be retained, all below ground infrastructure to a depth of 500mm would be removed during decommissioning, to assist the reintroduction of agricultural land uses.   | Decommissioning                          |
| R2                                       | <p>A Waste Management Plan (WMP) would be developed to minimise waste, <u>in consultation with Council</u>, including:</p> <ul style="list-style-type: none"> <li>• Identification of opportunities to avoid, reuse and recycle, in accordance with the waste hierarchy.</li> <li>• Quantification and classification of all waste streams.</li> <li>• Provision for recycling management on-site.</li> <li>• Provision of toilet facilities for on-site workers and identify that sullage would be disposed of (i.e., pump out to local sewage treatment plant).</li> <li>• Tracking of all waste leaving the site.</li> <li>• Disposal of waste at facilities permitted to accept the waste.</li> <li>• Requirements for hauling waste (such as covered loads).</li> </ul> | Construction/ Operation/ Decommissioning |

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| ID                        | Mitigation measures  | Project stage                               |
|---------------------------|--|---|
| R4                        | Solar panel arrays would be recycled at a facility with the capacity to recover 100% of the end-of-life solar PV modules and all associated materials.   | Decommissioning                             |
| R5                        | Lithium-Ion Batteries would be kept, stored, managed and transported according to manufacturer's instructions and the ADG Code<br>Any spent batteries would be recycled at a B-Cycle accredited, EPA permitted and licensed recycler of Li-Ion batteries.  | Construction/ Operation/<br>Decommissioning |
| R6                        | A septic system would be installed and operated according to the Tamworth Regional Council.  | Construction/ Operation/<br>Decommissioning |
| <b>Cumulative Impacts</b> |  |   |
| C 1                       | Environmental management plans for all stages of the Project will ensure provisions to consider to most relevant cumulative impacts within concurrent projects at the time of implementation, such as: <ul style="list-style-type: none"><li>• Traffic management: provisions to manage peak construction traffic.</li><li>• Housing: provisions to accommodate and transport workers.</li><li>• Employment: provisions to maximise local employment, in consideration of other local business requirements.</li></ul> | Construction, operation and decommissioning |

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Table B-2 BESS units hazard register (extract from Table 5-4 in the Rev 4.6 of the Preliminary Hazards Analysis, Pando Consulting, March 2024)

This table is relevant to meeting condition H1

| ID | Hazard     | Event               | Cause  | Consequence   | Controls  | Likelihood Rating |
|----|------------|---------------------|--|---|---|-------------------|
| 1  | Electrical | Exposure to voltage | <ul style="list-style-type: none"> <li>Short circuit/electrical connection failure</li> <li>Faulty equipment</li> <li>Incorrect installation</li> <li>Incorrect maintenance</li> <li>Human error during maintenance</li> <li>Safety device/circuit compromised</li> <li>Battery casing/enclosure damage</li> </ul> | <ul style="list-style-type: none"> <li>Electrocution</li> <li>Injury and/or fatality</li> <li>Fire</li> </ul> | <ul style="list-style-type: none"> <li>Equipment and systems will be designed and tested to comply with international standards and guidelines</li> <li>Engagement of reputable contractors</li> <li>Independent certifiers/owner's engineers</li> <li>Installation and maintenance will be done by trained personnel</li> <li>Electrical switch-in &amp; switch-out protocol (pad lock)</li> <li>BMS including fault detection and shut-off function</li> <li>Ground fault detection</li> <li>Manual Service Disconnect (MSD) switch</li> <li>Overcurrent protection</li> <li>Warning signs (electrical hazards, arc flash)</li> <li>Emergency Response Plan</li> <li>External assistance for firefighting (FRNSW &amp; RFS)</li> <li>Use of appropriate PPE</li> <li>Rescue kits (i.e., insulated hooks)</li> </ul> | Very Unlikely     |
| 2  | Arc flash  | Arc flash           | <ul style="list-style-type: none"> <li>Incorrect procedure (i.e., installation/ maintenance)</li> </ul>  | <ul style="list-style-type: none"> <li>Burns</li> <li>Injury and/or fatality</li> </ul>                       | <ul style="list-style-type: none"> <li>Equipment and systems will be designed and tested to comply with international standards and guidelines</li> </ul>   | Very Unlikely     |

| ID | Hazard | Event                                    | Cause  | Consequence  | Controls  | Likelihood Rating  |
|----|--------|--|--|--|---|--------------------|
|    |        |  | <ul style="list-style-type: none"> <li>Faulty equipment (e.g., corrosion on conductors)</li> <li>Faulty design (e.g., equipment too close to each other)</li> <li>Insulation damage</li> <li>Human error during maintenance</li> </ul> | <ul style="list-style-type: none"> <li>Exposure to intense light and noise</li> <li>Arc blasts and resulting heat, may result in fires and pressure waves</li> </ul>   | <ul style="list-style-type: none"> <li>Engagement of reputable contractors</li> <li>Independent certifiers/owner's engineers</li> <li>Site induction/substation training (i.e., high voltage areas)</li> <li>Installation and maintenance will be done by trained personnel</li> <li>Maintenance procedure (e.g., deenergize equipment)</li> <li>Preventative maintenance (insulation)</li> <li>Emergency Response Plan</li> <li>External assistance for firefighting (FRNSW &amp; RFS)</li> <li>Warning signs (arc flash boundary)</li> <li>Use of appropriate PPE for flash hazard</li> </ul> |                    |
| 3  | EMF    | Exposure to electric and magnetic fields | <ul style="list-style-type: none"> <li>Operations of power generation equipment</li> </ul>   | <ul style="list-style-type: none"> <li>High level exposure (i.e., exceeding the reference limits) may affect function of the nervous system (i.e., direct stimulation of nerve and muscle tissue and the induction of retinal phosphenes)</li> </ul> | <ul style="list-style-type: none"> <li>Location siting and selection (incl. separation distance)</li> <li>Optimising equipment layout and orientation</li> <li>Reducing conductor spacing</li> <li>Balancing phases and minimising residual current</li> <li>Incidental shielding (i.e., BESS building/enclosure, switchroom)</li> <li>Equipment and systems will be designed and tested to comply with international standards and guidelines</li> </ul>   | Extremely Unlikely |

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| ID | Hazard | Event | Cause  | Consequence  | Controls  | Likelihood Rating |
|----|--------|-------|--|--|---|-------------------|
|    |        |       |  | <ul style="list-style-type: none"> <li>Personnel injury</li> </ul>   | <ul style="list-style-type: none"> <li>Exposure to personnel is short duration in nature (transient)</li> <li>Physical warning signs (e.g., danger or restricted access)</li> <li>Studies found that the EMF for commercial solar power generation facilities comply with ICNIRP occupational exposure limits</li> </ul>  |                   |
| 4  | Fire   | Fire  | <ul style="list-style-type: none"> <li>Transformer oil leak</li> <li>Faulty equipment</li> <li>Arc flash</li> <li>External fire (e.g., bushfire, adjacent infrastructure)</li> </ul> | <ul style="list-style-type: none"> <li>Fire in switchyard and escalation to switchroom</li> <li>Release of toxic combustion products</li> <li>Injury/fatality</li> <li>Asset damage</li> <li>Interruption in power supply</li> </ul> | <ul style="list-style-type: none"> <li>Equipment and systems will be designed and tested to comply with the relevant international standards and guidelines</li> <li>Equipment will be procured from reputable supplier</li> <li>Independent certifiers/owner's engineers</li> <li>All relevant Transgrid's requirements will be met</li> <li>Installation, operations and maintenance by trained personnel (e.g., reputable third party) in accordance with relevant procedures</li> <li>Preventative maintenance (e.g., insulation, replacement of faulty equipment)</li> <li>Activation of emergency shutdown (ESD button)</li> <li>Fire Management Plan</li> <li>Emergency Response Plan</li> <li>External assistance for firefighting (FRNSW &amp; RFS)</li> </ul> | Very Unlikely     |

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| ID | Hazard | Event           | Cause  | Consequence  | Controls   | Likelihood Rating  |
|----|--------|-----------------|--|--|--|--------------------|
| 5  | Fire   | Switchroom fire | <ul style="list-style-type: none"> <li>• Equipment failure</li> <li>• Arc flash</li> <li>• Vandalism</li> <li>• External fire (e.g., bushfire, adjacent infrastructure)</li> </ul> | <ul style="list-style-type: none"> <li>• Fire in substation and escalation to switchyard</li> <li>• Release of toxic combustion products</li> <li>• Injury/fatality</li> <li>• Asset damage</li> <li>• Interruption in power supply</li> </ul> | <ul style="list-style-type: none"> <li>• Equipment and systems will be designed and tested to comply with the relevant international standards and guidelines</li> <li>• Equipment will be procured from reputable supplier</li> <li>• Independent certifiers/owner's engineers</li> <li>• All relevant Transgrid's requirements will be met</li> <li>• Inverter/transformers (PCUs) are in designated area</li> <li>• Installation, operations and maintenance by trained personnel (e.g., reputable third party) in accordance with relevant procedures</li> <li>• Preventative maintenance (e.g., insulation, replacement of faulty equipment)</li> <li>• Electrical switch-in &amp; switch-out protocol (pad lock)</li> <li>• Circuit breakers</li> <li>• Substation is locked and located in designated area</li> <li>• Security fence and controlled access</li> <li>• Activation of emergency shutdown (ESD button)</li> <li>• Fire Management Plan</li> <li>• Emergency Response Plan</li> <li>• External assistance for firefighting (FRNSW &amp; RFS)</li> </ul> | Extremely Unlikely |

| ID | Hazard   | Event                                     | Cause  | Consequence   | Controls   | Likelihood Rating |
|----|----------|---|--|---|--|-------------------|
| 6  | Fire     | Fire in temporary construction facilities | <ul style="list-style-type: none"> <li>• Kitchen fire</li> <li>• Paper fire</li> <li>• Smoking</li> </ul>  | <ul style="list-style-type: none"> <li>• Injury/fatality</li> <li>• Asset damage</li> </ul>   | <ul style="list-style-type: none"> <li>• Fire Management Plan</li> <li>• Cooling water supply on-site</li> <li>• Defendable boundary for firefighting will be established (i.e., asset protection zone)</li> <li>• Dedicated smoking area</li> <li>• Fire protection system in the temporary construction facilities</li> <li>• Emergency Response Plan</li> <li>• External assistance for firefighting (FRNSW &amp; RFS)</li> <li>• Use of appropriate PPE</li> </ul> | Very Unlikely     |
| 7  | Fire     | Bushfire                                  | <ul style="list-style-type: none"> <li>• Encroachment of off-site bushfire</li> <li>• Escalated event from facility fire</li> </ul>  | <ul style="list-style-type: none"> <li>• Injury/fatality</li> <li>• Asset damage</li> </ul>   | <ul style="list-style-type: none"> <li>• Fire Management Plan</li> <li>• Cooling water supply on-site</li> <li>• Defendable boundary for firefighting will be established (i.e., APZ)</li> <li>• Emergency Response Plan</li> <li>• External assistance for firefighting (FRNSW &amp; RFS)</li> <li>• Use of appropriate PPE</li> </ul>  | Very Unlikely     |
| 8  | Reaction | Thermal runaway in battery                | <ul style="list-style-type: none"> <li>• Elevated temperature</li> <li>• Bushfire</li> <li>• External fire (e.g., substation, transformer)</li> <li>• Electrical failure</li> <li>• Short circuit</li> </ul> | <ul style="list-style-type: none"> <li>• Fire in the battery cell</li> <li>• Injury/fatality</li> <li>• Escalation to the enclosure/building</li> </ul> | <ul style="list-style-type: none"> <li>• Equipment and systems will be designed and tested to comply with the relevant international standards and guidelines</li> <li>• Equipment will be procured from reputable supplier</li> <li>• Independent certifiers/owner's engineers</li> </ul>   | Very Unlikely     |

**Submission report**

Middlebrook solar farm



| ID | Hazard | Event | Cause   | Consequence   | Controls  | Likelihood Rating |
|----|--------|-------|---|---|---|-------------------|
|    |        |       | <ul style="list-style-type: none"> <li>• Excessive current/voltage</li> <li>• Imbalance charge across cells</li> <li>•</li> <li>• Mechanical failure</li> <li>• Internal cell defect</li> <li>• Damage (crush/penetration/puncture)</li> <li>•</li> <li>• Systems failure</li> <li>• Battery Management System (BMS) failure</li> <li>• HVAC failure</li> </ul> | <ul style="list-style-type: none"> <li>• Escalation to the entire BESS</li> </ul> | <ul style="list-style-type: none"> <li>• Fire protection system including gas detection and suppression and possible water suppression system</li> <li>• Separation distances in accordance with OEM UL9540A test reports</li> <li>• Pressure relief vent</li> <li>• Pressure blast panels</li> <li>• BMS including fault detection and shut-off function</li> <li>• Emergency stop</li> <li>• Ground fault detection</li> <li>• Overcurrent protection</li> <li>• Temperature monitoring</li> <li>• Safety shut-off function</li> <li>• HVAC system</li> <li>• Cell chemistry selection (minimise runaway)</li> <li>• Battery cell/pack design</li> <li>• ESS blocks housed in dedicated containers designed with 2-hour resistance rating</li> <li>• Activation of emergency shutdown (ESD button; outside of BESS or remotely from the O&amp;M building)</li> <li>• Fire Management Plan</li> <li>• Emergency Response Plan</li> <li>• External assistance for firefighting (FRNSW &amp; RFS)</li> </ul> |                   |

## Submission report

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| ID | Hazard   | Event  | Cause  | Consequence  | Controls   | Likelihood Rating |
|----|----------|--|--|--|--|-------------------|
| 9  | Chemical | Release of electrolyte (liquid/vented gas) from the battery cell | <ul style="list-style-type: none"> <li>Mechanical failure/damage</li> <li>Dropped impact (installation/maintenance)</li> <li>Damage (crush/penetration/puncture)</li> <li>Abnormal heating/elevated temperature</li> <li>Thermal runaway</li> <li>Bushfire</li> <li>External fire (e.g., substation, transformer)</li> </ul> | <ul style="list-style-type: none"> <li>Release of flammable liquid electrolyte</li> <li>Vapourisation of liquid electrolyte</li> <li>Release of vented gas from cells</li> <li>Fire and/or explosion in battery enclosure/building</li> <li>Release of toxic combustion products</li> <li>Injury/fatality</li> </ul> | <ul style="list-style-type: none"> <li>Equipment and systems will be designed and tested to comply with the relevant international standards and guidelines</li> <li>Equipment will be procured from reputable supplier</li> <li>Independent certifiers/owner's engineers</li> <li>Engagement of reputable contractors</li> <li>Installation and maintenance will be done by trained personnel</li> <li>Layers of battery case (pod and external casing)</li> <li>Spill cleanup using dry absorbent material</li> <li>BMS including fault detection and shut-off function</li> <li>HVAC system</li> <li>BESS fire protection system</li> </ul> | Very Unlikely     |
| 10 | Chemical | Coolant leak   | <ul style="list-style-type: none"> <li>Mechanical failure/damage</li> <li>Incorrect maintenance</li> </ul>   | <ul style="list-style-type: none"> <li>Irritation/injury for personnel on exposure (inhalation)</li> </ul>   | <ul style="list-style-type: none"> <li>Equipment and systems will be designed and tested to comply with the relevant international standards and guidelines</li> <li>Equipment will be procured from reputable supplier</li> <li>Independent certifiers/owner's engineers</li> <li>Engagement of reputable contractors</li> <li>Maintenance will be done by trained personnel</li> </ul>   | Very Unlikely     |

## Submission report

Middlebrook solar farm



| ID | Hazard   | Event                          | Cause   | Consequence  | Controls  | Likelihood Rating |
|----|----------|--------------------------------|---|--|---|-------------------|
|    |          |                                |   |  | <ul style="list-style-type: none"> <li>• Layers of battery case (pod and external casing)</li> <li>• Spill cleanup using dry absorbent material</li> <li>• BMS fault detection and shut-off function</li> <li>• PPE</li> </ul>  |                   |
| 11 | Chemical | Refrigerant leak               | <ul style="list-style-type: none"> <li>• Mechanical failure/damage</li> <li>• Incorrect maintenance</li> </ul>  | <ul style="list-style-type: none"> <li>• Irritation/injury for personnel on exposure (skin contact)</li> </ul> | <ul style="list-style-type: none"> <li>• Equipment and systems will be designed and tested to comply with the relevant international standards and guidelines</li> <li>• Equipment will be procured from reputable supplier</li> <li>• Independent certifiers/owner's engineers</li> <li>• Engagement of reputable contractors</li> <li>• Maintenance will be done by trained personnel</li> <li>• BESS layers of battery case (pod and external casing)</li> <li>• BESS BMS fault detection and shut-off function</li> <li>• Chiller Unit separation distance to other equipment</li> <li>• PPE</li> </ul> | Very Unlikely     |
| 12 | Chemical | Exposure to hazardous material | <ul style="list-style-type: none"> <li>• Inappropriate storage use and handling of pesticides/herbicides for vegetation management and landscaping</li> </ul> | <ul style="list-style-type: none"> <li>• Irritation/injury for personnel on exposure</li> </ul>                | <ul style="list-style-type: none"> <li>• Product will be stored in dedicated storage area in a bund</li> <li>• A spill kit will be kept near the dedicated storage area</li> <li>• Quantity kept in work area will be minimised</li> </ul>  | Very Unlikely     |

## Submission report

Middlebrook solar farm



| ID | Hazard   | Event   | Cause   | Consequence  | Controls  | Likelihood Rating |
|----|----------|---|---|--|---|-------------------|
|    |          |   |   |  | <ul style="list-style-type: none"> <li>No spraying will be done during high wind</li> <li>Limited usage prior to and during rain events</li> <li>PPE (as required by Safety Data Sheet)</li> </ul>  |                   |
| 13 | Diesel   | <p>Release of diesel from storage tank or filling point</p> <p>Release of diesel during handling/ transfer to generator set</p> | <ul style="list-style-type: none"> <li>Mechanical failure</li> <li>Human error during transfer</li> </ul> | <ul style="list-style-type: none"> <li>Fire (if ignited)</li> <li>Injury/fatality</li> </ul> | <ul style="list-style-type: none"> <li>Equipment and systems will be designed and tested to comply with Australian standards &amp; guidelines (e.g., AS 1940)</li> <li>Engagement of reputable contractors</li> <li>Independent certifiers/owner's engineers</li> <li>Installation and maintenance will be done by trained personnel</li> <li>Diesel is a combustible liquid and will be stored away from other flammable materials (e.g., gasoline)</li> <li>Secondary containment (i.e., bunding)</li> <li>Warning signs (combustible material)</li> <li>Fire Management Plan</li> <li>Defendable boundary for firefighting will be established</li> <li>Emergency Response Plan</li> <li>External assistance for firefighting (FRNSW &amp; RFS)</li> <li>Use of appropriate PPE</li> </ul> | Very Unlikely     |
| 14 | Gasoline | Release of gasoline from storage tank or filling point  | <ul style="list-style-type: none"> <li>Mechanical failure</li> <li>Human error during transfer</li> </ul> | <ul style="list-style-type: none"> <li>Fire</li> <li>Injury/fatality</li> </ul>              | <ul style="list-style-type: none"> <li>Equipment and systems will be designed and tested to comply with Australian standards &amp; guidelines (e.g., AS 1940)</li> <li>Engagement of reputable contractors</li> </ul>   | Very Unlikely     |

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Middlebrook solar farm



| ID | Hazard           | Event   | Cause   | Consequence   | Controls   | Likelihood Rating  |
|----|------------------|---|---|---|--|--------------------|
|    |                  |   |   |   | <ul style="list-style-type: none"> <li>Independent certifiers/owner's engineers</li> <li>Installation and maintenance will be done by trained personnel</li> <li>Secondary containment (i.e., bunding)</li> <li>Warning signs (flammable material)</li> <li>Fire Management Plan</li> <li>Defendable boundary for firefighting will be established</li> <li>Emergency Response Plan</li> <li>External assistance for firefighting (FRNSW &amp; RFS)</li> <li>Use of appropriate PPE</li> </ul> |                    |
| 15 | External factors | Fire (BESS, Inverter/transformers (PCUs), substation switchrooms) | <ul style="list-style-type: none"> <li>Water ingress (e.g., rain, flood)</li> </ul> | <ul style="list-style-type: none"> <li>Electrical fault/short circuit</li> <li>Fire</li> <li>Injury/fatality</li> </ul>               | <ul style="list-style-type: none"> <li>Location siting (i.e., outside of flood prone area)</li> <li>Switchrooms and BESS are housed in dedicated enclosure/building. which will be constructed in accordance with relevant standards</li> <li>Drainage system</li> <li>Preventative maintenance (check for leaks)</li> </ul>   | Extremely Unlikely |
| 16 | External factors | Vandalism   | <ul style="list-style-type: none"> <li>Unauthorised personnel access</li> </ul>     | <ul style="list-style-type: none"> <li>Asset damage</li> <li>Potential hazard to unauthorized person (e.g., electrocution)</li> </ul> | <ul style="list-style-type: none"> <li>Project infrastructures are in secure fenced area</li> <li>Onsite security protocol</li> <li>Warning signs</li> <li>During construction, the area will be patrolled, and fence will be installed</li> </ul>   | Unlikely           |

## Submission report

Middlebrook solar farm



| ID | Hazard           | Event            | Cause   | Consequence   | Controls   | Likelihood Rating |
|----|------------------|------------------|---|---|--|-------------------|
| 17 | External factors | Lightning strike | <ul style="list-style-type: none"><li>• Lightning storm</li></ul> | <ul style="list-style-type: none"><li>• Injury/fatality</li><li>• Fire</li><li>• Asset damage</li></ul> | <ul style="list-style-type: none"><li>• Earthing</li><li>• Lightning protection mast (Substations)</li><li>• PPE</li></ul> | Very Unlikely     |