Planning guideline

State code 26: Solar Farm development

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Contact us

✆ +61 7 3328 4811 or 13 QGOV (13 74 68)
@ info@dsdilgp.qld.gov.au
💻www.statedevelopment.qld.gov.au
✉ PO Box 15009, City East, Queensland 4002
🏠1 William Street, Brisbane 4000

Contents

1.0 Introduction

1.1 Purpose of the guideline

Solar farm development has the potential for adverse impacts on individuals, communities and the natural environment. Solar farm development will be considered appropriate where unacceptable adverse impacts on individuals, communities and the environment do not arise from the solar farm development.

This guideline provides advice to applicants on how to respond to the purpose and performance outcomes of state code 26: Solar farm development of the State Development Assessment Provisions (SDAP). This guideline does not provide advice to applicants on additional material that should be submitted with an impact assessable application to an assessment manager. This additional advice should be sought via a pre-lodgement request to the State Assessment and Referral Agency (SARA).

This guideline is advice that only applies to a development application for a material change of use (MCU) for solar farm development, applied for under the *Planning Act 2016* (the Planning Act).

Following this guideline will assist applicants to develop project layouts, supporting technical reports, plans and strategies to enable assessments to be undertaken efficiently. Use of this guideline by applicants however will not guarantee a favourable assessment outcome.

1.2 Regulatory framework

Solar farm definition

The Planning Regulation 2017 (the Planning Regulation) defines a solar farm as follows:

solar farm—

(a) means the use of premises for the generation of electricity or energy from a source of solar energy, other than electricity or energy to be used mainly on the premises; and

(b) includes the use of premises for any of the following if the use relates, or is ancillary, to the use stated in paragraph (a)—

(i) a building or structure, including, for example, a site office or temporary workers' accommodation;

(ii) a storage area or maintenance facility, including, for example, a lay down area;

(iii) infrastructure or works, including, for example, site access, foundations, electrical works, substations, facilities or devices for storing and releasing energy, or landscaping.

Assessment manager – Impact Assessment

The determination of the assessment manager depends on whether the solar farm is a 'relevant' solar farm and if any other assessable development is prescribed assessable development.

SARA is the assessment manager for an MCU for a relevant solar farm where the development includes:

(a) no other assessable development; or

(b) if other assessable development is prescribed, assessable development only.

If any other assessable development is not prescribed assessable development, the Minister decides which entity will be the assessment manager.

> ***prescribed assessable development*** *means development stated to be assessable development in—*
>
> *(a) schedule 9 [of the Planning Regulation 2017]; or*
>
> *(b) schedule 10, other than schedule 10, part 15 or 16 [of the Planning Regulation 2017].*
>
> ***relevant solar farm*** *means—*
>
> *(a) a solar farm that has a maximum instantaneous electricity output of 1MW or more; or*
>
> *(b) a solar farm in a priority development area.*

If the proposed solar farm is not a **relevant solar farm** - the local government will be the assessment manager.

MCUs for solar farms that will be assessed by SARA must address the community benefit system introduced by the Queensland Government. Details of this system are available on the department's website at https://www.planning.qld.gov.au/planning-framework/community-benefit.

MCUs for solar farms assessed by SARA will be impact assessable. It is important to note that the Planning Act and the Planning Regulation collectively require that SARA, as assessment manager:

- **must assess against** prescribed benchmarks – being State code 26: Solar farm development of SDAP
- **must have regard** to prescribed matters (including elements of planning schemes and common material)
- **may have regard** to other relevant matters (dependent on the facts of an individual application)
- **consider** all properly made submissions.

All MCU solar farm applications assessed by SARA will involve State code 26: Solar farm development of SDAP. Depending on circumstances, concurrent Operational Work applications for vegetation clearing for Solar farms may trigger assessment against State code 16: Native vegetation clearing of SDAP.

1.3 Other approvals

There may be additional statutory requirements under the Planning Act, the Planning Regulation and other applicable legislation. Subsequent development applications (for example, operational works, ERAs or building works applications) may also be required by a local government, SARA, a port authority or another entity as prescribed under the Planning Regulation.

Further approvals or permits may also be required from a range of entities including local authorities, the Commonwealth Government, the state-owned network service provider and air services stakeholders.

Although some of these other approvals are identified throughout this guideline, they should not be taken to be the full extent of other approvals that may be required for a specific proposal. The onus rests with applicants/ proponents to determine and seek all relevant approvals prior to commencing construction of a project.

2.0 Seeking SARA Pre-lodgement Advice

It is highly recommended applicants seek pre-lodgement advice from SARA prior to lodging a development application for a solar farm.

Pre-lodgement advice can assist applicants in determining appropriate SARA matters, understanding the requirements of the relevant SDAP codes, ascertaining SARA's preliminary views on the acceptability of site layouts and providing clarity on other material that should be provided with an impact assessable application. Advice on technical assessments, reports and methodologies as outlined in this guideline will also be provided as part of pre-lodgement advice.

When seeking pre-lodgement advice from SARA, applicants are expected to have awareness of their obligations under the community benefit system introduced by the state government. If this is not the case, SARA officers will direct applicants in the first instance to material on the department's website that outlines these requirements.

Applicants that are aware of and are responding to these obligations are welcome to seek pre-lodgement SARA advice:

- while they are working on social impact assessment (SIA) and community benefit agreement (CBA) obligations to concurrently be preparing their SARA applications
- when SIA and CBA obligations have been completed and applicants are endeavoring to finalise applications to SARA
- where the chief executive has given notice that a SIA report and/or CBA is not required and applicants are endeavoring to finalise SARA applications.

To assist in preparing application material required by State code 26 of SDAP, applicants may wish to engage with the following stakeholders prior to seeking pre-lodgement advice:

- the state-owned network service provider (Energy Queensland) and the transmission provider (Powerlink Queensland). This is to ensure that the solar farm can ultimately be appropriately connected to the existing electricity grid. Refer to the Australian Energy Market Commission's (2014) National Electricity Rules Chapter 5: Network Connection, Planning and Expansion for further details
- Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (DNRMMRRD), Land and Surveying Services to confirm land tenure status. Under Section 199A of the *Land Act 1994*, a lease may only be used for its designated purpose. If a host lot is under a lease arrangement the solar farm use may not be consistent with the purpose of the lease for the lot and will need to be amended. DNRMMRRD will also advise if the project requires a section 22A Relevant Purpose Determination to lodge a development application to SARA

- Department of Transport and Main Roads (DTMR) to discuss impacts of development traffic on state transport infrastructure (road and rail), mitigation requirements and any separate approvals required directly from DTMR (for example constructing upgrades or placing third-party electricity infrastructure in state-controlled roads). This will ensure the information submitted with the application for MCU approval and obtaining further approvals (outside of the MCU approval process) does not delay construction of the development
- relevant railway managers to discuss approval requirements for taking oversize/overmass (OSOM) loads over railway corridors or interfering with railway corridors
- the National Heavy Vehicle Regulator regarding approvals for OSOM movements
- Queensland Fire Department (QFD) for advice on the requirements of a detailed bushfire management plan and safety and emergency management plan. This is to ensure bushfire prone areas are identified and that hazard analysis and risk to people and essential community infrastructure is assessed to achieve reduced exposure to natural hazards. QFD can advise on setbacks and asset protection zones, location and layout of solar farm development footprints, including associated infrastructure such as workers accommodation, high voltage lines, battery energy storage facilities, substations and switchyards. The consultation should also include Local Disaster Management Groups and any local community bushfire advisory groups for impact risk analysis and planning, emergency response, and bushfire mitigation.
- DNRMMRRD if the applicant considers that the vegetation categories or Regional Ecosystems are mapped incorrectly. It is recommended an application be made to amend the mapping prior to submitting a development application. Mapping can be amended through applying for a detailed Property Map of Assessable Vegetation (PMAV). Further information on how to apply for a PMAV is available online at https://www.qld.gov.au/environment/land/management/vegetation/maps/map-correction

3.0 Supporting application material

This part of the planning guideline provides information on reporting that should be provided to support a MCU application for a solar farm development. As outlined previously, this advice focuses on responding to State code 26 only and does not address other material that should be provided to SARA for its impact assessment deliberations.

The table below identifies the type of reports that are required to be submitted when lodging an application for a solar farm and the reports that are likely to be conditioned as part of a development permit for MCU for a solar farm.

The reports listed in the first column of the table are the minimum required to respond to the code. An information request is likely to be issued if an application does not include these reports. There may be circumstances where additional reports are required during the assessment. Further details regarding the content of these reports are included in Section 4 of the guideline.

Reports required at lodgement	Reports that will likely be conditioned
Areas of high ecological value	
Ecological Assessment Report (PO1)	Vegetation and Fauna Management Plan (PO1)
	Cleared Vegetation Management Plan (PO1)
Agricultural land	
Agricultural Land Assessment (PO2 – PO5)	
Protecting water quality and stormwater management	
Site plan illustrating the development avoids waterways, wetlands, and drainage lines (PO7)	Stormwater Management Plan (PO7 & PO8)
Statement that addresses drainage control and bank stability (PO7 & PO8)	Rehabilitation Management Plan (PO7 & PO8)
Natural hazards and disasters	
Natural Hazard Risk Assessment Report (PO9)	Bushfire Management Plans (PO9)
	Safety and Emergency Management Plans (PO10)
Acoustic amenity	
Noise Impact Assessment (PO11)	Updated Noise Impact Assessment (PO11)

Reports required at lodgement	Reports that will likely be conditioned
	Noise Monitoring Plan (PO11)
	Operational Noise Strategy (PO11)
Visual amenity, glint and glare	
Visual Impact Assessment (If the relevant state or local government planning scheme has identified the site in an area of high scenic amenity) (PO12)	
Glint and Glare Assessment (PO13 & PO14)	
Social impacts	
Community benefit agreement or a notice given by the chief executive under section 106ZE(1)(b) of the Planning Act stating that a community benefit agreement is not required for the application (PO15)	Community benefit agreement (PO15)
Transport networks and access	
Heavy Vehicle and OSOM Construction Concept Strategy (PO19)	Traffic Impact Assessment (PO16 – PO20)
	Traffic Management Plan (PO16 – PO20)
Decommissioning	
Decommissioning Security Report (PO24)	End of Construction Decommissioning Management Plan (PO21 – PO24)
	End of Operation Decommissioning Management Plan (PO21 – PO24)
Other	
	Construction Environmental Management Plan
	Waste Management Plan

4.0 SDAP Assessment

This part of the guideline provides further details on the information that is required to demonstrate compliance with the purpose and performance outcomes of State code 26: Solar farm development of SDAP.

Advice contained in this part of the guideline is the minimum required to respond to the code. Applicants are encouraged to provide additional material in support of aspects of a project that may be contentious or particularly challenging.

4.1 Meeting the purpose of the code

The purpose of the code is to ensure development for a solar farm:

1. is located, sited, designed, constructed, operated and maintained to mitigate any adverse impacts to individuals, communities, the environment, agricultural land, adjacent sensitive land uses and sensitive receptors; and infrastructure and services
2. ensures impacts arising from the construction, operation and decommissioning do not result in unacceptable adverse impacts on individuals, communities, the environment, agricultural land, adjacent sensitive land uses and sensitive receptors; and infrastructure and services
3. is decommissioned in a timely and efficient manner that reuses, recycles and/or repurposes materials to the greatest extent possible and rehabilitates the environment.

The assessment benchmarks for the code comprise:

- a purpose statement which identifies the overall intent of the code
- performance outcomes which specify assessment benchmarks.

Development complies with the code where:

- it complies with all relevant performance outcomes; or
- development does not meet the relevant performance outcome(s) and SARA determines, on balance, that the development complies with the purpose statement.

There are no acceptable outcomes for this code.

4.2 Meeting performance outcomes: Areas of high ecological value

Context

Solar farms are typically constructed on gently undulating and cleared terrain. This may involve significant land modification and clearing of vegetation to provide the necessary physical conditions for large amounts of photovoltaic panels and supporting ancillary infrastructure. These interventions could lead to the loss or fragmentation of habitats and impacts on waterways and fauna movement patterns within areas of high ecological significance.

The reflective nature of solar panels can also cause water-dependent birds to mistake solar panels for water bodies. Heat emissions from the panels and ancillary equipment may also affect surrounding sensitive vegetation and microclimates.

Applicants are required to consider these impacts on areas of high ecological value both on the immediate site and surrounding areas. These, and other aspects are important considerations particularly when a project is in proximity to National or State Parks, World Heritage Areas (including the Wet Tropics and the Great Barrier Reef) and the like.

Supporting action – PO1

During assessment

Ecological Assessment Report

An **Ecological Assessment Report (EAR)** should be lodged with an application to demonstrate how the project complies with PO1. This report should be prepared by competent professionals of suitable expertise and have regard to the methodology outlined in **Appendix 1 – Ecological Assessment Report (EAR) methodology**.

An **EAR** is the principal report that will be reviewed by SARA to determine whether compliance with PO1 is achieved. Failure to prepare and lodge a comprehensive **EAR** with an application will likely result in Information Requests and/or Advice Notices being issued by SARA after lodgement.

An **EAR** should identify the nature and characteristics of all on-site flora and fauna. This information should then be correlated with the proposed project layout to identify and assess resultant risks to flora, fauna and associated habitats. The **EAR** should then outline how the project layout has been modified to, from the proponent's perspective, achieve compliance with PO1. This analysis and outline of how the project has been correspondingly modified is an important demonstration of how proposed disturbance has "*avoided*" unacceptable impacts on the habitats specified in PO1.

The rest of the **EAR** should then demonstrate how the proposed project layout aims to minimise and mitigate impacts on the habitats specified in PO1. It is also important that the **EAR** acknowledges and responds to the

ecological values of areas outside of but proximate to the project site. This is particularly important if a project is proximate to National or State Parks/Forests and World Heritage listed areas (including the Wet Tropics and the Great Barrier Reef) and the like.

It is strongly recommended that applicants prepare an **EAR** having regard to **Appendix 1 – Ecological Assessment Report (EAR) methodology.**

Conditions of approval

These conditions will require the preparation of several detailed plans prior to commencing construction. These plans will include:

- a **Vegetation and Fauna Management Plan (VFMP)**. A **VFMP** addresses all aspects of the clearing of vegetation to ensure that impacts on flora and fauna are minimised and mitigated. A VFMP may be required to be prepared in accordance with relevant sections of an EAR that was submitted for assessment.
- a **Cleared Vegetation Management Plan (CVMP)** outlining how all felled vegetation is proposed to be stacked, stored, reused, mulched and/or removed off site. The **CVMP** will also include strategies to manage bushfire risks associated with the clearing and management of vegetation.
- a detailed **Rehabilitation Management Plan (RMP)** to be prepared after construction has commenced and prior to its completion. An RMP must be prepared by a suitably qualified ecologist, be generally in accordance with relevant sections of a lodged **EAR** or **PRP**, and outline how areas cleared for construction will be:
- rehabilitated (returned over time to pre-disturbance regional ecosystem or condition); and/or
- restored (using grasses, groundcovers and other local indigenous species that are consistent with the composition of surrounding vegetation communities); and/or
- stabilised (using hard engineering devices and measures complemented by landscaping)
- prepared cognisant of and complementary to a **Site Stabilisation Plan – Operations (SSPO)** (which will also be conditioned to achieve compliance with PO8)
- reflective of agreements to deliver parts of the disturbance footprint to a condition requested by landowners.

Applicants will also be conditioned to monitor and provide yearly progress reports on rehabilitation outcomes for 5 years after the commencement of full operations of the solar farm.

Note: Rehabilitation imposts will not reduce or remove the need for an environmental offset under other relevant legislation or codes, unless there is adequate demonstration that the rehabilitation works will address impact on matters

of environmental significance. Refer to section 3.5.2 of the General guide for the Queensland Environmental Offsets framework for further information.

Other approvals (associated with PO1)

Where clearing of vegetation is unavoidable and has been approved by SARA, it is the applicant's responsibility to ensure all relevant approvals and permits are obtained, including under the *Planning Act 2016*, the *Vegetation Management Act 1999,* the *Nature Conservation Act 1992* and the *Environment Protection and Biodiversity Conservation Act 1999.*

4.3 Meeting performance outcomes: Agricultural land

Context

Solar farm developments can lead to the reduction or loss of **high-quality agricultural land** in regional areas across Queensland. Having regard to local context and the scale of loss of agricultural land this could result in unacceptable adverse impacts on individuals, rural communities, and the broader agricultural sector, as well as on the long-term viability of productive soils.

Project layouts should avoid significant loss of **high-quality agricultural land** whilst minimising detrimental impacts on the long-term viability of productive soils. Applicants must carefully assess site suitability and prioritise locating solar farms on land that does not compromise Queensland's agricultural prosperity or diminish the important role of agriculture in supporting regional economies and communities.

Where a solar farm is proposed on **high-quality agricultural land**, applicants must demonstrate 'no significant loss' from the perspective of the degree of impact on the agricultural productivity and prosperity of the local government area and surrounding region. This is particularly important in those parts of the state where local and state governments have sent clear policy signals regarding the significance of agricultural productivity and how it needs to be balanced with competing land uses.

Supporting action – PO2-PO5

During assessment

Applicants are required to submit an **Agricultural Land Assessment (ALA)** report that demonstrates the proposal does not result in a significant loss of **high-quality agricultural land**.

The **ALA** report should address the following:

- identify whether the site contains **high-quality agricultural land** values (as defined in State code 26 of SDAP)

- clarify and map the amount of hectares of **high-quality agricultural land** the footprint of the solar farm will impact
- if the amount of hectares of impacted **high-quality agricultural land** is believed to constitute 'no significant loss' - provide a short ALA report supporting this conclusion as evidence of compliance with PO2-PO4
- if the project footprint proposes to impact on a material quantum (to be determined on a case-by case basis) of **high-quality agricultural land** values - a comprehensive **ALA** needs to be prepared which:
    - is prepared by a suitably qualified professional and with consideration of relevant sections of the *Guidelines for Agricultural Land Evaluation in Queensland* (Queensland Government, 2015)
    - includes a description of the historic use of the site for agricultural production (if any)
    - includes an assessment of soils and land suitability for agricultural production (of the area affected by the project footprint)
    - provides information about the agricultural *potential* of the **high-quality agricultural land** on the site (as an indicator of agricultural production that might be foregone for the life of the project)
    - acknowledge the amount of hectares of **high-quality agricultural land** that will be removed from potential agricultural production by the project footprint
    - calculate the percentage and quantum of the alienation of **high-quality agricultural land** associated with the proposal against the quantum of **high-quality agricultural land** in the broader local government area
    - assess the implications of the alienation of the identified amount of **high-quality agricultural land** associated with the project footprint for the life span of a typical solar farm (in the range of 30-40 years). This assessment should have regard to:
        - where the agricultural uses involves sugar cane production – implications on viability of local mill/s and supply chains
        - where the agricultural pursuit is other than sugar cane - whether the loss of agricultural production would have adverse impacts on local or regional agricultural and economic productivity and viability. Whether the alienation of locally significant agricultural productivity could affect viability thresholds of supply chains, processing plants and the like.
    - should underpin conclusions that demonstrate that the development:

- avoids significant loss of **high-quality agricultural land** (PO2)
- will maintain soil fertility and productivity (avoiding irreversible impacts on soil quality), and will allow for restoration to pre-construction values after operations cease (PO3)
- avoids land fragmentation, ensuring land connectivity to support ongoing agricultural use (PO4)
- if on or near a stock route network, does not compromise its primary purpose for moving stock (PO5).

4.4 Meeting performance outcomes: Protecting water quality and stormwater management

Context

Solar farms have the potential to significantly alter the physical and environmental characteristics of an area. This can include affecting soil composition, hydrology, run off and water quality. Careful planning, design, and management are essential to minimise harm to on-site and adjacent sensitive environmental features and to ensure the long-term sustainability of the landscape.

Acid sulfate soils, when disturbed, can release harmful substances such as acid, iron, and other contaminants, posing a serious threat to water quality and ecosystem health. Solar farms need to minimise disturbance of acid sulfate soils as far as possible. If disturbance is unavoidable, effective management strategies such as soil neutralisation and containment must be implemented to prevent adverse impacts. Activities like vegetation clearance, excavation, and drainage changes should be carefully planned to mitigate risks associated with these soils, ensuring design approaches are adapted to minimise disturbances. Failure to manage these risks adequately can lead to long-term environmental damage, regulatory non-compliance, and harm to surrounding ecosystems.

The construction and operation of solar farms must also safeguard water quality in nearby receiving waters, waterways, and wetlands. Poorly managed site preparation, including earthworks, vegetation removal, or alterations to natural drainage lines, can cause erosion, sediment runoff, and contamination of adjacent aquatic systems. Site layouts must avoid interaction with sensitive waterways and wetland areas wherever practicable and ensure that any unavoidable impacts are effectively controlled through erosion and sediment management. Waterway banks and natural drainage structures must be stabilised to protect aquatic habitats and maintain the hydrological functions of these areas.

Water flow and drainage must be carefully managed to minimise disruption to natural systems. Solar farms should maintain the stability and natural structure of waterways and drainage banks, avoiding unnecessary

hardening or modifications that could interfere with ecological values. Using low-impact approaches and prioritising nature-based solutions can deliver both functional and environmental benefits. These approaches also provide a foundation for the ultimate decommissioning of the solar farm and returning the land to its pre-development condition.

Managing stormwater effectively is another essential consideration for solar farms, given their expansive layouts and potential to alter natural hydrological dynamics. Poorly managed drainage can lead to localised flooding, erosion, and sedimentation, disrupting the natural flow and balance of overland water pathways. Development must integrate robust stormwater systems that retain natural flow paths, rates, and volumes. Sustainable features, such as vegetative swales, detention basins, and permeable surfaces, should be incorporated into designs to mitigate potential impacts and preserve pre-development hydrological conditions.

Supporting action – PO6

Conditions of approval

If the proposed development is likely to cause disturbance or oxidisation of acid sulfate soil, a condition will be imposed to ensure affected soil is treated and thereafter managed (until the affected soil has been neutralised or contained) in accordance with the current *Queensland Acid Sulfate Soil Technical Manual: Soil management guidelines*, prepared by the Department of Science, Information Technology, Innovation and the Arts, 2014.

Supporting action – PO7 & PO8

During assessment

Provide a **site plan** identifying waterways, wetlands, and drainage lines, along with buffer zones to confirm that these areas will be avoided. If crossings near these features are unavoidable, provide low-impact methods, such as culverts, and detail how natural drainage patterns will be preserved. Measures to minimise erosion and sediment runoff, such as retaining vegetation, should also be included, along with a commitment to regular monitoring, especially during periods of heavy rain.

To address drainage control and bank stability, provide a **statement** prepared by an RPEQ specialising in water quality and stormwater specifying systems that naturally manage runoff and prevent water flow concentration. The statement must also confirm that construction and operation will not destabilise waterway banks and detail any rehabilitation works, such as revegetation. The statement can also outline a commitment to use permeable surfaces where feasible and avoid non-essential hardening or modification of waterways.

Conditions of approval

If, during an assessment, SARA is of the view components of PO7 and PO8 can be complied with through conditions, the approval will require the preparation of a detailed **Stormwater Management Plan (SWMP)** and **Rehabilitation Management Plan (RMP)** prior to the full operations of the solar farm.

Other approvals

Approving a MCU for a solar farm does not preclude the need for proponents to determine whether a separate development application under the Planning Act, or compliance with the Accepted Development Requirements for operational works that is construction or raising waterway barrier works, is required. Further information on what constitutes a waterway barrier work is available through the Department of Primary Industries website.

4.5 Meeting performance outcomes: Natural hazards and disasters

Context

Solar farms are typically located in areas that can be exposed to natural hazards such as flooding and bushfires and, in some cases, disasters such as cyclones, heatwaves and droughts. The construction of solar farms involves significant numbers of workers spread over large areas. Solar farms can also impact on surrounding communities. Plans and strategies need to be in place to ensure the safety of on-site workers and surrounding communities in the event of natural hazards or disasters occurring.

Solar farms should be designed, constructed and operated to minimise the exposure and vulnerability of the built form of the solar farm to natural hazards and disasters.

Site layouts need to facilitate access for emergency vehicles to respond to bushfires and other emergency events that could occur such as fires in battery storage systems. Failure to design, construct and maintain access tracks could impeded the ability for workers to leave the site in emergency conditions while inhibiting access for emergency vehicles.

Supporting action – PO9 & PO10

During assessment

Site layouts should be informed by an assessment of natural hazard risk. A **Natural Hazard Risk Assessment Report** should be prepared and lodged with an application to demonstrate compliance with PO9 and PO10. In addressing PO9, this assessment should demonstrate that all parts of the project layout would be located outside of natural hazard areas and responsive to the risks posed by natural hazards and disasters that could affect the site. In addressing PO10, this assessment should demonstrate that the location and design both at construction and operational stages protects people and animals from natural hazards or disasters.

For bushfire risk, the proponent should utilise the *Bushfire Resilient Communities Technical Reference Guide for the State Planning Policy State Interest 'Natural Hazards, Risk and Resilience - Bushfire (October 2019)* when designing the proposed development.

Conditions of approval

Conditions will be imposed requiring the preparation of a detailed **Bushfire Management Plan (BMP)** and a separate **Safety and Emergency Management Plan (SEMP)** to ensure that construction and operational workforces and surrounding community members are appropriately protected.

The **BMP** must:

Be prepared in consultation with QFD, relevant landowners and relevant local governments and include:

- a fire hazard analysis
- evacuation procedures for construction workforce in the event of a bushfire emergency
- emergency response procedures for landowners and surrounding communities
- mitigation strategies to achieve the development outcomes in Part E of the *State Planning Policy July 2017 – Natural Hazards, Risk and Resilience.*

The **SEMP** should include the following details:

- a Hazard Analysis and Risk Assessment (HARA) undertaken in accordance with *AS/NZ ISO 31000:2009 Risk Management Principles and Guidelines* and with *HB203:2006 Environmental Risk Management Principles and Processes*
- emergency evacuation plans for the construction and operation phases of the development
- safety management plans and emergency response procedures in consultation with the state and regional emergency service providers and provide an adequate level of training to staff who will be tasked with emergency management activities.

4.6 Meeting performance outcomes: Acoustic amenity

Context

Solar farms, including ancillary infrastructure, must be designed, constructed, and operated to ensure noise emissions do not adversely impact nearby sensitive land uses. Sensitive uses may include residencies, educational institutions and healthcare facilities. While solar farms typically produce less noise than wind farms, ancillary components like inverters, transformers, batteries and cooling systems can generate steady, low-level noise that requires consideration of impacts.

Audible noise emissions, such as humming from equipment or vehicle traffic during construction, can cause nuisance or discomfort if not appropriately mitigated. Site layouts should ensure noise generating equipment is sited away from sensitive receptors and that necessary acoustic shielding or buffers are incorporated.

Supporting action – PO11

During assessment

Noise generating elements of a proposed project (such as inverters, transformers, BESSs and cooling systems) must be spatially identified on a proposed project layout plan. An initial analysis should be undertaken to determine if any sensitive receptors are proximate enough to noise generators that would warrant a detailed **Noise Impact Assessment (NIA)** report to be undertaken. If no sensitive receptors are deemed likely to be affected by on-site noise generation, then evidence should be provided to this effect to demonstrate compliance with PO11.

If any sensitive receptors are considered close enough to noise generators that they could possibly be affected by noise, then a **NIA** report should be prepared to demonstrate compliance with the relevant levels in the Environmental Protection (Noise) Policy 2019 (EPP Noise) (PO11).

The **NIA** report:

- must be undertaken by a suitably qualified acoustic consultant who is an RPEQ or is eligible for membership in the Australian Acoustical Society or whose firm is a member of the Association of Australasian Acoustical Consultants (AAAC)
- describe and quantify operational noise sources and operating modes, where applicable. Where feasible and available, spectral data should be used within the calculations
- undertake 3D noise modelling using industry best-practice methods, utilising prediction algorithms that consider attenuations from distance, ground effects, terrain/shielding effects, atmospheric absorption and meteorological conditions
- utilise the noise model to predict noise level impacts onto nearby sensitive receptors under typical worst-case noise enhancing conditions (i.e. under downwind and/or temperature inversions conditions)
- assess the modelled impacts against the prescribed criteria and PO11, considering any modifying factors/penalties
- where noise impacts on sensitive receptors are predicted, identify mitigation measures or strategies to reduce or eliminate noise levels to achieve compliance with the EPP Noise (and therefore PO11).

Conditions of approval

Where sensitive receptors are identified as being potentially exposed to noise levels close to or potentially exceeding relevant levels in the EPP Noise, conditions of approval will likely require:

- noise generating elements of the project to be delivered '*generally in accordance with*' their depiction on an approved project layout plan

- a once-off noise monitoring report of the 'as-constructed' project will be conditioned to demonstrate that EPP Noise levels at sensitive receptors are not being exceeded.

4.7 Meeting performance outcomes: Visual amenity, glint and glare

Context

Large scale solar farms will inevitably be visible from off-site vantage points and residences. This visibility per say is not taken to create an adverse impact in the context of State code 26. PO12 of the state code outlines a policy intent of minimising visual impacts of a solar farm where it is proposed in a locality having defined scenic amenity or landscape values. These values must be articulated in a state (such as Regional Plan) or local government planning instrument (such as strategic framework and overlays/codes in a planning scheme). PO12 is therefore only a relevant assessment consideration where the proposed solar farm could have impacts on these defined areas of value.

Preserving the scenic amenity of regions valued for their landscape quality is essential for protecting cultural and social connections to place, tourism appeal, and broader community expectations. In these situations it is important that proponents carefully select sites and pay attention to site layout and design to achieve compliance with PO12.

Another critical visual consideration for solar farms is mitigating glint and glare impacts (PO13 & PO14). Glint (a momentary flash of reflected sunlight) and glare (a more sustained reflection of bright light) can pose a nuisance to adjoining sensitive uses (PO13) and a hazard to aviation, railways and drivers of vehicles on adjacent roads by reducing visibility and creating distractions (PO14). To address this, solar panels should be located, oriented, and designed to minimise light reflectivity in all directions, utilising anti-reflective coatings or materials where feasible. Adjusting panel angles to avoid reflections that intersect flight paths, roads or other sensitive locations is a key design strategy. Additionally, landscape screening measures—such as the retention of existing vegetation or the planting of new buffers—can be implemented to block any residual glint or glare and ensure the amenity of adjoining sensitive uses and safety of aviation and road users.

Supporting action – PO12

During assessment

Where PO12 is a relevant assessment consideration, evidence will need to be provided to demonstrate compliance with this required outcome. If a relevant state or local government planning instrument has identified that the proposal could impact on defined areas of high scenic and/or landscape amenity, a **Visual Impact Assessment Report (VIAR)** should be submitted as evidence of compliance with PO12.

The **VIAR** should:

- outline the scenic amenity context and how it is represented in relevant state and/or local government planning instruments
- describe how the siting and layout of solar farm elements have been arranged to minimise visual impacts on described scenic values. This could include aspects such as aligning arrays with land contours, avoiding infrastructure on ridge lines and other visually prominent locations, and incorporating design features such as screen planting that blend the development harmoniously into the environment
- include visual simulations or photomontages demonstrating the anticipated visual appreciation of the proposed solar panels from key public viewpoints and viewing corridors
- an assessment of how the solar panels and/or infrastructure elements visible from viewpoints and/or viewing corridors do not adversely impact on scenic amenity values.

Conditions of approval

If a **VIAR** proposes mitigation measures, such as screen planting, a condition of approval will require the mitigation measures to be undertaken prior to the operation of the solar farm.

Supporting action – PO13 & PO14

During assessment

A Glint and Glare Assessment (GGA), undertaken by a suitably qualified consultant who specialises in glint and glare, should be submitted with the application. The GGA should be prepared in accordance with the *Large-Scale Solar Energy Guideline* (NSW Government, 2022) and in consultation with the relevant authorities and stakeholders to identify suitable standards and expectations. Relevant authorities and stakeholders may include:

- Road – Department of Transport and Main Roads, local government
- Rail – Queensland Rail, Department of Transport and Main Roads, Aurizon, Pacific National.
- Aviation – CASA, airport operators, Airservices Australia.

The GGA should include the following:

- identify surrounding residential, road, rail, and aviation receptors
- thresholds that may be impacted by glint and glare (i.e. refer to table 7 of the Large-Scale Solar Energy Guideline and the relevant authorities for road, rail and aviation)
- utilise the Solar Glare Hazard Analysis Tool (SGHAT) to model impacts on a worst-case scenario (e.g. clear weather all-year round)
- assess the modelled impacts against the performance objectives in table 7 of the Large-Scale Solar Energy Guideline

- where a significant glint and glare impact is modelled, identify suitable mitigation measures to reduce or eliminate impact
- undertake further SGHAT modelling accounting for identified mitigation measures to assess glint and glare impacts post-mitigation measures
- present conclusions (which may include recommended conditions) as to why the proposal complies with PO13 and PO14.

ForgeSolar is the commercial tool that utilises SGHAT and has a guidance on its website that provides an overview of the fundamentals relating to glint and glare and how the tool is used, including its limitations and assumptions. ForgeSolar's website is available at: https://www.forgesolar.com/

Conditions of approval

Where mitigation measures are required to achieve compliance with PO13 or PO14, these will likely be attached as conditions of approval.

4.8 Meeting performance outcomes: Social impacts

Context

The Queensland Government has introduced a community benefit system that applies to all MCU applications for solar farms that will be assessed by SARA. Prior to lodging an application with SARA, applicants are required to have satisfied obligations required under this system. Details of the community benefit system are available on the department's website at https://www.planning.qld.gov.au/planning-framework/community-benefit.

In dealing with social impacts that could arise from a solar farm, PO15 reflects the two main outcomes from responding to these requirements being:

- a proposed project has an executed community benefit agreement (CBA); or
- a proposed project has sought and received an exemption from developing a CBA.

Supporting action – PO15

During assessment

If an applicant has an executed CBA, a copy of this document and its underpinning social impact assessment report should be lodged with the application as evidence of compliance with PO15.

If an applicant has obtained notice under section 106ZE of the Planning Act waiving the requirement for a CBA, a copy of this document should be submitted with the application. This document should be accompanied by a

report that demonstrates how "*social impacts of the development are identified, managed, mitigated, counterbalanced and monitored.*"

Conditions of approval

Elements of, or in some cases the entirety of a CBA, are likely to form conditions of an approval.

Likewise, elements of the report provided to demonstrate compliance with PO15 may flow through to conditions of approval.

4.9 Meeting performance outcomes: Transport networks and access

Context and supporting actions for PO16 – PO20

The construction of solar farms involves substantial volumes of construction traffic, including heavy vehicle haulage. While solar farms do not require the transportation of turbine components like wind farms, the large-scale delivery of materials such as solar panels, mounting structures, inverters, transformers, and batteries can still necessitate heavy and occasionally Oversize/Overmass (OSOM) vehicle transport. These materials are often moved from coastal ports or manufacturing facilities to sites in regional or remote areas, leading to significant loads on local and state road networks during construction.

During assessment

Some solar farm projects may encounter challenges in securing practical and feasible haulage routes following development approvals. PO19 requires proponents to support applications with analysis providing a level of confidence that heavy vehicle haulage can be organised to support project construction following approvals. A **Heavy Vehicle and OSOM Construction Concept Strategy** should be prepared and submitted supporting compliance with PO19. All relevant stakeholders (including Port Authorities, local government traffic managers, DTMR regional offices and the National Heavy Vehicle Regulator) should be consulted in the preparation of this strategy. The **Heavy Vehicle and OSOM Construction Concept Strategy** should outline:

- the consultation that has occurred with relevant stakeholders in the formulation of the strategy
- details of the proposed solar farm components used to develop the strategy, including information on expected material volumes and the dimensions and weights of components requiring heavy or OSOM haulage
- proposed vehicle types and availability to be used for OSOM haulage
- key identified 'pressure points' on proposed OSOM routes such as bridges, structures, railway level crossings and any sections of constrained horizontal and vertical geometry

- details of how the proposed construction haulage can be feasibly achieved, at full cost to the proponent, including identifying appropriate 'pressure point' route mitigation measures and concept road upgrades.

If a proposal requires direct access for construction traffic off a state-controlled road, additional information will need to be submitted to demonstrate compliance with PO20. In these circumstances, details of proposed intersection upgrades need to be submitted with the application in accordance with DTMR's requirements under section 62 of the *Transport Infrastructure Act 1994* permits and normal SARA requirements seeking to gain approvals for upgrades to state controlled roads.

Conditions of approval

All SARA approved solar farm applications will be conditioned to prepare a **Traffic Impact Assessment (TIA)** prior to the commencement of construction transport activities. The primary purpose of a **TIA** is to identify any upgrades that are required to state and local government road networks (including railway level crossings) to enable the passage of solar farm construction traffic. Any identified upgrades will need to be implemented at full cost to applicants prior to the commencement of construction traffic. Preparation of a **TIA** needs to include engagement with relevant stakeholders including local government traffic managers, regional DTMR officers and Queensland Rail (if railway level crossings are likely to be affected). The formulation of a **TIA** should be based on DTMR's GTIA guideline, any relevant local government guidelines, policies or standards and Queensland Rail level crossing specifications.

Approved applications will also be conditioned to prepare a **Traffic Management Plan (TMP)** prior to commencement of construction activities. The primary purpose of a **TMP** is to outline management strategies for all types of construction traffic that warrant such strategies. As a minimum. A **TMP** needs to include a detailed management strategy to ensure the safe and efficient haulage of heavy and OSOM solar farm components from ports to construction sites. A **TMP** must also include but not be limited to providing:

- details of all solar farm components triggering OSOM haulage including details of maximum weights and dimensions (heights, widths and lengths)
- proposed haulage vehicle configurations including axle spacings, axle and gross masses, ground contact width, tyre sizes and evidence of ability of proposed vehicles to safely haul identified components
- loaded widths, length and height measurements of the various OSOM components to be hauled
- detailed route/s identification and assessment of ability of the identified routes to safely haul proposed OSOM components
- identified conflict points of OSOM component haulage with existing infrastructure (including but not limited to bridges, culverts and other structures)

- evidence that bridges, culverts and other structures on haulage routes can accommodate heavy haulage vehicles under load
- management strategies to ensure that railway level crossings and associated road safety are not adversely affected by construction traffic
- evidence of the capacity of escorts (police and non-police) to service haulage demands in accordance with relevant legislative requirements.

Other approvals

It is the applicant's responsibility to ensure all relevant approvals and permits are obtained, including under the *Planning Act 2016,* the *Transport Infrastructure Act 1994*, and the *Local Government Act 2009* to confirm the suitability of the road network for the movement of OSOM vehicles and mitigate impacts accordingly. The National Heavy Vehicle Regulator can assist in identifying the proposed haulage route for OSOM vehicles, however other relevant entities, such as the Ports Authority, Energy Queensland, Queensland Rail and Local Government are also likely to have specific requirements to allow for the safe movement of items on the road network during construction.

Applicants will also need to consider and obtain permits as necessary under the *Transport Infrastructure Act 1994* and *Electricity Act 1994* if seeking to place or connect to any third-party utility infrastructure within a state-controlled road.

4.10 Meeting performance outcomes: Decommissioning

Context

Decommissioning a solar farm is the responsibility of the approval holder and is undertaken in two distinct phases:

- following completion of construction and commencement of full operations, then
- at the end of the operational life of the project.

Detailed decommissioning plans will be required prior to each of these project phases. Actions in these plans will be conditioned to be implemented in accordance with strategies outlined in the plans.

Decommissioning activities that are detailed in management plans should ensure that there are no adverse impacts on individuals, communities and the natural environment as a result. This typically involves activities to 'make good' the land and remove infrastructure.

PO28 requires evidence of financial security to ensure that the two phases of decommissioning occur in a timely manner with minimal risks to landowners and government.

Supporting action – PO21 to PO24 (also PO3)

Conditions of approval

End of construction decommissioning

Conditions of approval will require proponents to prepare an **End of Construction Decommissioning Management Plan (ECDMP)** to be submitted to SARA prior to finalisation of construction of the solar farm. The **ECDMP** will outline all actions required to:

- remove all above ground non-operational structures and equipment such as construction site offices, concrete batching plants, on-site accommodation camps etc
- reflect any agreements with landowners about on-site conditions
- remove and clean up any contamination caused during construction as defined in the *Environmental Protection Act 1994*.

The **ECDMP** should not duplicate but needs to be compatible with **Rehabilitation Management Plans (RMPs)** and **Site Stabilisation Plan - Operations (SSPOs)** that will also be conditioned to be prepared prior to finalisation of construction activities.

End of operations decommissioning

Conditions of approval will also require the preparation of an **End of Operation Decommissioning Plan (EODMP)** six months prior to the ceasing of a solar farms' operations.

An **EODMP** should be informed by consultation with relevant stakeholders including landowners and will outline all actions required to:

- deconstruct and remove off-site all structures and infrastructure (including solar panels, arrays and associated footings, substations, and above ground cabling)
- manage impacts on the transport network arising from removal of materials from the site
- decontaminate any affected areas in accordance with requirements of the *Environmental Protection Act 1994*
- achieve outcomes described in PO3 being – "*to return the land to its pre-construction land values*."

All of the above aspects of the **EODMP** can be varied through agreements with landowners who may desire to have certain project elements, such as parts of access tracks, left in situ to support the ongoing use of the property.

The **EODMP** should aim to maximise the recycling, repurposing and/or reuse of all materials removed from the site during decommission. A key objective of a decommissioning plan is to minimise materials destined for landfill and to implement the full decommissioning of the project as efficiently and sustainably as possible.

Supporting action – PO24

During assessment

To demonstrate compliance with PO24, applicants are required to provide a **Decommissioning Security Report**. This report needs to provide evidence of the proposed financial security (bonds, financial guarantees or similar) that will ensure compliance of decommissioning at end of construction and at end of operations - at no cost to landowners (that are not project operators) or the government.

Conditions of approval

If SARA deems that PO24 is complied with, a condition of approval will require the implementation of the proposed financial securities to underpin end of construction and end of operations decommissioning.

5.0 Appendices

Appendix 1 – Ecological Assessment Report (EAR) methodology

An **EAR** should be prepared and submitted with an application to demonstrate how PO1 is to be complied with. This report should have regard to the methodology outlined below.

An **EAR** should include:

- project details including, history, location, site details, project footprint, expected operational life of the solar farm
- outline of planning and approvals framework relevant to the project
- description of detailed studies and expert inputs into the **EAR**
- details of desktop assessment of all relevant environmental documents, databases, maps and legislation used to identify ecological values both on and around the site
- details of how the desktop assessment informed field studies and surveys
- determining 'Likelihood of occurrence' for threatened flora and fauna
- details of ecological surveys undertaken including survey times, durations, expertise involved on survey teams and survey conditions. Two seasonal field surveys to map the vegetation and identify flora and fauna species, should be undertaken in accordance with *Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland*. Version 6.0 (Neldner et al, 2022) and consideration of *Terrestrial Vertebrate Fauna Survey Assessment Guidelines for Queensland,* Version 4.0 (Eyre et al. 2022).
- description of the project environment including existing land uses, landforms and geology, presence of wetlands and waterways and climate
- description of vegetation communities including results of ground-truthed RE mapping showing distribution of individual RE types
- identification of and distribution of any threatened flora
- details of fauna habitat types
- details of fauna species including acknowledging status under relevant state and/or Commonwealth legislation
- details of invasive species (having regard to *Biosecurity Act 2014*)
- details of presence of pest animals

- description of identified vegetation corridors, linkages and connectivity and relevance to identified fauna
- description of MSES listed species and categorisation
- assessment of impacts of project construction and operations on flora, vegetation communities and fauna including:
    - based on details of proposed clearing involved with the project footprint
    - consideration of potential impacts on the integrity of flora, fauna and landscapes of high-value wilderness areas (including but not limited to World Heritage Areas, National and State parks) proximate to the site boundaries
    - statement of compliance with PO1. Details of how the project layout has been designed, constructed, and planned to avoid areas of high ecological value and details of proposed mitigation measures that, subject to assessment by SARA, may form the basis of conditions of approval and parameters to be incorporated into detailed reports and strategies prepared prior to commencement of construction
    - determination of Significant Residual Impacts (MSES matters)
    - determination of MSES offsets
    - figures, tables and appendices containing all relevant documents and reports used in the preparation of the **EAR**.

6.0 Abbreviations

Abbreviation	Meaning
ALA	Agricultural Land Assessment.
AS	Australian Standard.
AS/NZS	Australian Standard/New Zealand Standard.
BMP	Bushfire Management Plan.
CBA	Community Benefit Agreement.
CVMP	Cleared Vegetation Management Plan.
EAR	Ecological Assessment Report.
ECDMP	End of Construction Decommissioning Management Plan.
EODMP	End of Operation Decommissioning Management Plan.
EP Act	*Environmental Protection Act 1994*.
EPP (Noise)	Environmental Protection (Noise) Policy 2008.
ESCPC	Erosion and Sediment Control Plan – Construction.
GGA	Glint and Glare Assessment
ISO	International Standards Organisation.
NIA	Noise Impact Assessment.
PRP	Preliminary Rehabilitation Plan.
QLD	Queensland.
RMP	Rehabilitation Management Plan.
RPEQ	Registered Professional Engineer of Queensland.
SEMP	Safety and Emergency Management Plan.
SIA	Social Impact Assessment.
SMP	Stormwater Management Plan.
SSPO	Site Stabilisation Plan – Operations.
TIA	Traffic Impact Assessment.
TMP	Traffic Management Plan.
VFMP	Vegetation and Fauna Management Plan.
VIAR	Visual Impact Assessment Report

Department of State Development, Infrastructure and Planning
PO Box 15009 City East Qld 4002 Australia
Tel 13 QGOV (13 74 68)
info@dsdilgp.qld.gov.au
www.statedevelopment.qld.gov.au
Connect with us @GrowingQld