Green Gold Energy (sponsored by Department for Energy and Mining)
Development of a 200MW solar facility and associated infrastructure

Bower Road and Mickan Road, Australia Plains
Development Application 24003878

CONTENTS:

OVERVIEW

DEVELOPMENT NO.	24003878
APPLICANT	Green Gold Energy Pty Ltd Sponsored by Department for Energy and Mining s131(2)(c) PDI Act
CONSENT SOUGHT	Development Approval
ADDRESS	• Lot 315 Bower Road, Australia Plains • 91 Mickan Road, Australia Plains
NATURE OF DEVELOPMENT	Development of a solar farm comprising approximately 430,000 solar photovoltaic (PV) panels with total generation capacity of 200MW and associated infrastructure
ZONING INFORMATION	**Zone:** • Rural **Overlays**: • Hazards (Bushfire – Regional) • Hazards (Flooding – Evidence Required) • Murray-Darling Basin • Native Vegetation • Water Resources **Variations:** • Minimum Site Area (100ha)
LODGEMENT DATE	27 March 2024
RELEVANT AUTHORITY	Minister for Planning
PLANNING AND DESIGN CODE	P&D Code Version 2024.5 14/03/2024
CATEGORY OF DEVLEOPMENT	Crown Development (s131 – State Agency sponsored development)
APPEAL RIGHTS	Nil
NOTIFICATION	Public notification required - 16 representors, four (4) wishing to be heard
REFERRALS STATUTORY	Regional Council of Goyder Native Vegetation Council
REFERRALS NON-STATUTORY	Commissioner of Highways Country Fire Service
DELEGATION	SCAP (as the delegate of the SPC) to provide advice to the Minister for Planning pursuant to Section 131 (17) of the *Planning, Development and Infrastructure Act 2016*.
REPORT AUTHOR	Fiona Selleck, Senior Urban Planner

EXECUTIVE SUMMARY

The Australia Plains Solar Facility proposes construction of a 200MW facility comprising around 430,000 solar panels, a substation and a 275kV connection to the state transmission network. The facility will be complemented by a Battery Energy Storage System (BESS) that was granted exemption under *Planning, Development and Infrastructure (General) Regulations 2017* (r.106, Schedule 13) by the Minister for Planning on 4 April 2024, and is not the subject of this application.

The application has been sponsored by the Department for Energy and Mining as 'essential infrastructure' pursuant to Section 131 *Planning, Development and Infrastructure Act 2016.*

A self-assessment found no referral was required under the *Environment Protection and Biodiversity Conservation Act (Cwth) 1999*.

The subject land comprises two (2) contiguous parcels located 10.5 kilometres south-west of Robertstown and 13 kilometres north-west of Eudunda. The rural semi-arid locality features undulating farming land used for grazing and marginal cropping dotted with isolated dwellings and outbuildings.

There are 12 dwellings within 3 kilometres (km) of the site, three of which are within 2 km. The local topography and existing vegetation screens views from nearby dwellings to the subject site. Vegetation within and bordering the site includes native grasses, low shrubs and stands of mallee.

The development cost of the project which exceeds $10 million and was therefore publicly notified for four (4) weeks between 16 May 2024 and 14 June 2024. Sixteen (16) submissions were received, all in opposition of the proposal. Four (4) respondents elected to be heard. The applicant has prepared a response to the respondents' concerns.

Council does not object to the proposed development. The Native Vegetation Council, Commissioner of Highways and Country Fire Service also had no objections to the proposal subject to conditions of approval. Conditions relate to technical requirements regarding environmental construction management; selection of the preferred haulage route and associated road upgrades and traffic management; and reflecting fire mitigation measures in the final design.

The potential for environmental impacts during construction and/or operation can be appropriately managed through the implementation of management plans, such as a Construction Environmental Management Plan (CEMP) and an Operational Environmental Management Plan (OEMP).

The Rural Zone of the Planning and Design Code supports the South Australian economy through a range of primary production, forestry and renewable energy activities. The zone envisages renewable energy facilities where they minimise significant fragmentation and displacement of existing primary production. The construction of a solar facility in proximity to the existing state-wide electricity transmission network is consistent with the intent of the zone.

The proposed development is considered to be in accordance with key policies of the Native Vegetation, Hazards (Bushfire, Flooding) and Water Resources Overlays, as well as General Development policies relating to renewable energy facilities, design, interface matters, transport and clearance from powerlines.

It has been assessed that the proposal is not seriously at variance with the relevant provisions of the Planning and Design Code and warrants the granting of Development Approval, subject to the assignment of relevant conditions to manage external impacts during construction and operation.

ASSESSMENT REPORT

1. BACKGROUND

1.1 Project Driver

Green Gold Energy's proposed Australia Plains Solar Farm Project aims to contribute to Australia's transition to renewable energy and improve stability and reliability of the energy market – a priority of both the South Australian and Australian Governments. During its construction phase, the $510 million project is expected to generate over 150 jobs. The facility will have an operational life of 40 years.

1.2 Environment Protection & Biodiversity Conservation Act (Cwth) 1999 (EPBC Act)

An EPBC Act self-assessment determined that there will be no significant impact to any Matters of National Environmental Significance (MNES) resulting from the proposed development and that a referral under the Act is not required. The self-assessment (see Appendix 1L) was undertaken by EBS Ecology on behalf of the applicant in March 2024 and involved a desktop assessment and field surveys.

1.3 Process

The application has been assessed in accordance with the provisions of s.131 of the *Planning, Development and Infrastructure Act 2016* (PDI Act) including mandatory and information referrals, and public notification. Key stages of the application and assessment process are summarised in Table 1.

As required by regulation 107 of the *Planning, Development and Infrastructure (General) Regulations 2017*, the application was accompanied by a certificate from the Office of the Technical Regulator (OTR) supporting the proposed generator on the basis that the facility includes a 200MW/400MWh BESS.

A site visit was undertaken by DHUD-PLUS staff on Wednesday 23 October 2024.

Table 1: Process Summary

8 Aug 2023	Technical Regulator certification issued (r107 PDI Regulations)
25 Aug 2023	Applicant sought support of Department for Energy and Mining (DEM) for the project through: • Crown sponsorship under s131 of the PDI Act, and • Consideration of an exemption under schedule 13(2) of the PDI Regulations for construction of the associated battery energy storage system (BESS).
4 Oct 2023	DEM sponsorship granted for the development for the purposes of 'essential infrastructure' (s131 PDI Act)
27 Mar 2024	**Development application lodged** with the State Planning Commission (SPC)
27 Mar 2024	Applicant advises SPC of intention to amend the proposal to expand the proposed solar array from 150MW to 200MW and that they are seeking exemption of the BESS
2 April 2024	Technical Regulator certification issued for amended scale of solar array (s107 PDI Regulations)
4 Apr 2024	**Minister for Planning grants exemption for construction of BESS** at Lot 315 Bower Road, Australia Plains from the need for approval under the PDI Act by notice published in the Gazette (sch 13(2) PDI Regulations)
23 Apr 2024	DEM sponsorship granted for the amended development for the purposes of 'essential infrastructure' (s131 PDI Act)
1 May 2024	**Amended development application lodged** with the SPC, excluding the BESS and expanding the size of the solar array from 150MW to 200MW
16 May 2024 – 14 June 2024	Public Notification
27 Mar 2024 – 10 Sep 2024	Referrals, Requests for Information and Response from applicant

If a development authorisation is granted for the solar farm, the approval will address the requirements that need to be met by the applicant for the final design and construction phases of the development. The operational and decommissioning phases of the facility would be managed under the regulatory regime of the *Hydrogen and Renewable Energy Act 2023* administered by the Department for Energy and Mining, in accordance with the transitional provisions of the Act and regulations.

2. DETAILED DESCRIPTION OF PROPOSAL

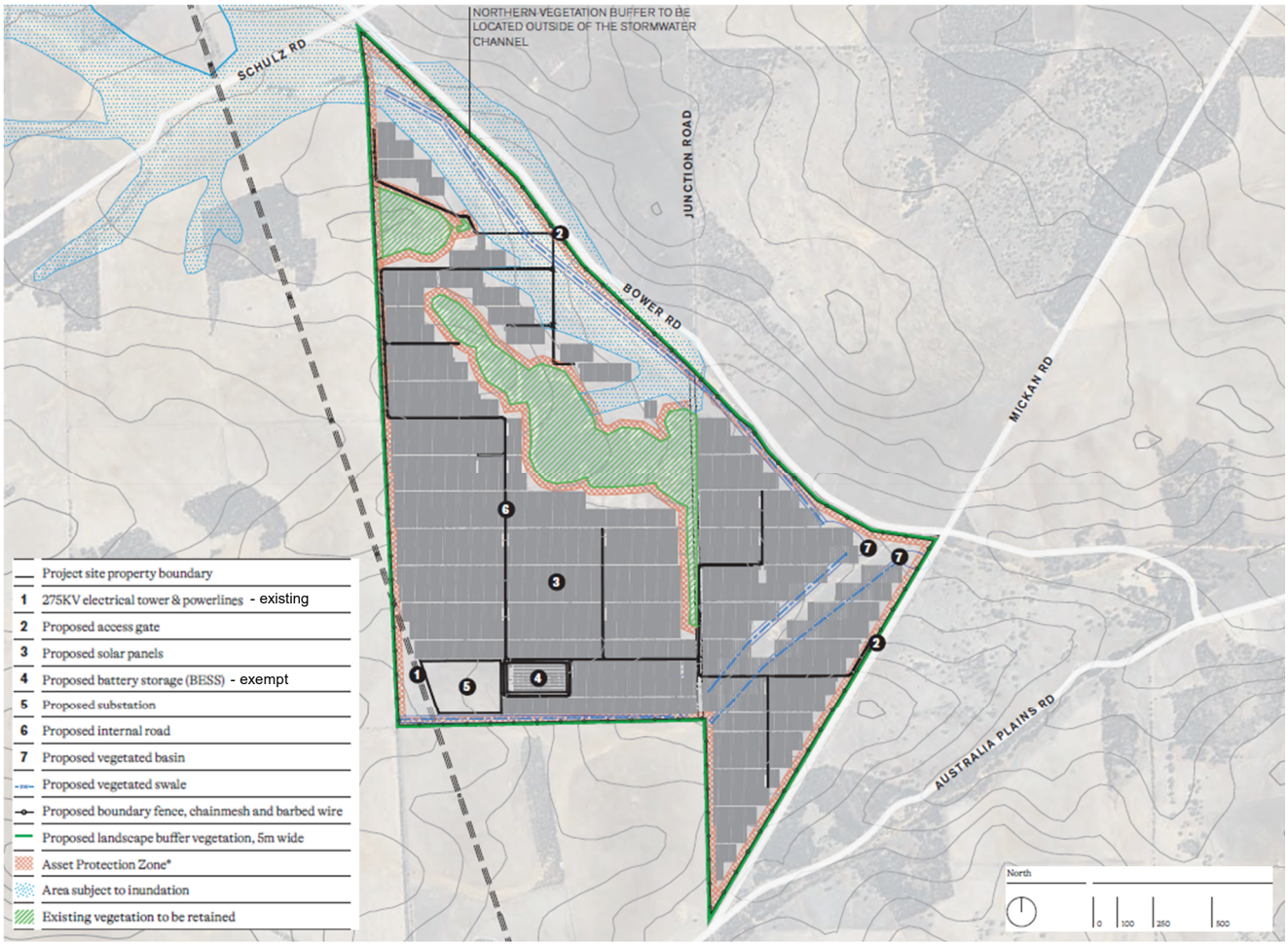


Figure 1: Site Plan – Concept Layout (Source: Landskap)

2.1 Proposal

As illustrated in Figure 1, the proposed development comprises:

Solar Panels

Installation of approximately 430,000 solar photovoltaic (PV) panels with a total generation capacity of 200MW over an estimated 235 hectares of the site. As shown in Figure 2, each solar panel will be approximately 2 metres by 1 metre and mounted on trackers in a two-panel portrait arrangement, resulting in a maximum array width of around 4.06 metres.

The project will consist of approximately 4032 rows of trackers spaced approximately 6 metres apart. Each row will contain around 108 panels resulting in a maximum array length of around 100 metres. The foundations for the tracking system typically comprise driven poles (most common), screw piles or mass concrete foundations that are sized to resist uplift and lateral loading during wind events.

The proposed tracking system comprises a horizontal single axis aligned north-south, with maximum rotation range of +/- 60°. The height of the tracking system will depend on the final design, with the current proposal having a maximum height to centroid of 2 metres and maximum height at full rotation of 3.83 metres.

Figure 2: Example Ground-Mounted Solar Array (Source: Green Gold Energy)

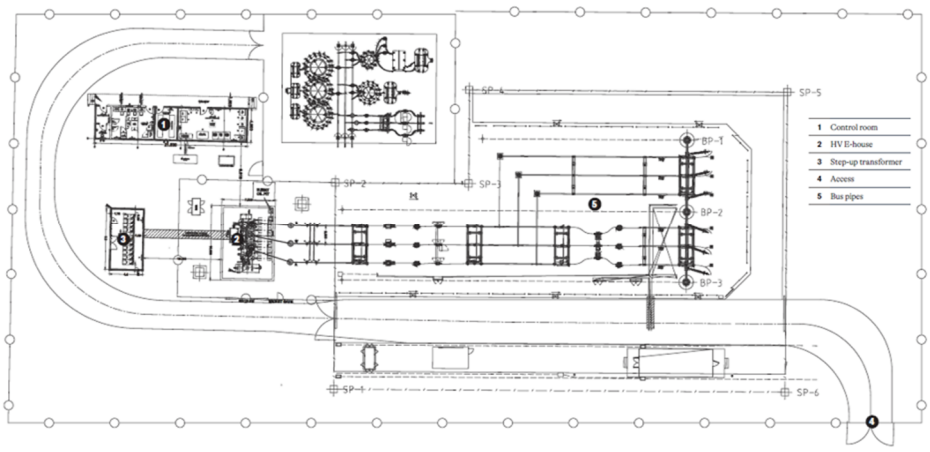
New Substation and Overhead 275kV Transmission Line

Construction of a substation and associated electricity infrastructure in the south-western corner of the subject site adjacent the existing 275 kilovolt (kV) transmission line. The substation will be connected to the existing transmission network by a new 275kV overhead transmission line of approximately 100 metres in length.

The final configuration of the substation, grid connection and associated electricity infrastructure are dependent upon network requirements. The final detailed design will be developed in consultation with ElectraNet to ensure network requirements are met.

The facility will include security fencing (see Ancillary Works), technical control and CCTV devices to allow the site to be remotely monitored and ensure public safety and protection of the infrastructure.

An indicative substation configuration is provided in Figure 3, with the bus pipes to have a height of approximately 6-10 metres. The substation, associated infrastructure and asset protection zone will occupy approximately 5.6 hectares (ha) of the southwest corner of the subject site as shown in Figure 1.



EXAMPLE BUS PIPES, 6-10m IN HEIGHT

Figure 3: Indicative Substation Plan (Source: Green Gold Energy)

Water Tanks

Installation of water tanks for fire-fighting purposes consisting of a minimum 2 x 72,000 litre tanks located adjacent the proposed BESS (not subject of this application) and substation, as per Country Fire Service (CFS) requirements. The precise number, size and location to be determined in liaison with the CFS.

Access and Transport

The application identifies two (2) site access points as shown in Figure 1:

- off Bower Rd toward the north tip of the allotment near the intersection with Schulz Rd, and
- off Mickan Rd along the south-eastern boundary of the Mickan Rd allotment.

Primary generation of traffic will occur during the construction phase, involving up to 15 heavy vehicle movements per day (up to 26m B-double combination) and up to an additional 30 light vehicle movements per day (assuming all construction staff are accommodated off-site).

The applicant has identified two potential haulage routes to the site from World's End Highway. The applicant proposes to liaise with Council and the Department for Infrastructure and Transport (DIT) to determine the preferred route and is committed to implementing any improvements required to ensure safe traffic operations.

Ancillary Works

Given the nature of the proposed facilities, the applicant has a legislative obligation to demonstrate that the site will be appropriately secured to prevent unauthorised access. Accordingly, the proposed development will be enclosed by a 2.3 m high security fence incorporating closed-circuit television (CCTV) devices on 2.5m high poles. All buildings on-site will be alarmed. The fence will consist of 1.8m cyclone mesh topped with barbed wire as illustrated in Figure 4.

Figure 4: Example Security Fencing (Source: Planning Aspects)

2.2 Design Options and Considerations

Throughout the assessment process the applicant has updated the plan for the proposed development to incorporate feedback provided by council, state agencies and respondents. Key changes include:

- Identification of Asset Protection Zones (APZ) to mitigate fire / bushfire risk
- Demarcation of stormwater management measures, including vegetation swales, retention ponds and reducing the footprint of the solar arrays to avoid areas subject to inundation.

The applicant also undertook additional investigations during the assessment to better clarify impacts and mitigation measures with respect to native vegetation, visual impact, and glint and glare.

2.3 Out of scope

The following works on the site do not require Development Approval under the PDI Act:

- Battery Energy Storage System (BESS) – exemption granted under schedule 13, Clause 2(1) and 2(3) PDI Regulations by the Minister for Planning (Gazette notice published 4 April 2024)
- Underground cabling - exempt pursuant to schedule 13(1)(c) PDI Regulations
- Temporary construction site offices - exempt pursuant to schedule 4(4)(h) PDI Regulations.

2.4 Construction Snapshot

The applicant is seeking two (2) years to substantially commence construction and four (4) years to complete construction.

Timing	▪ 24 months - commencing 2025 (subject to approvals) and operational from 2027
Workforce	▪ Approx.150 workers
Environmental & Traffic Management	▪ Construction Environmental Management Plan (CEMP) to be prepared by contractor. ▪ Approx. 15 heavy vehicles per day and 30 light vehicles per day. ▪ Traffic Management Plan to be prepared for Council and DIT prior to start of works. ▪ Temporary parking and internal access tracks for onsite loading / unloading.

3. SITE AND LOCALITY

Location Reference	Plan Parcel	Title Reference	Council	Hectares
Lot 315 Bower Road Australia Plains	H120800 S315	CT 5972/348	Goyder	315.00
91 Mickan Road Australia Plains	H120800 S57	CT 5907/538	Goyder	91.65

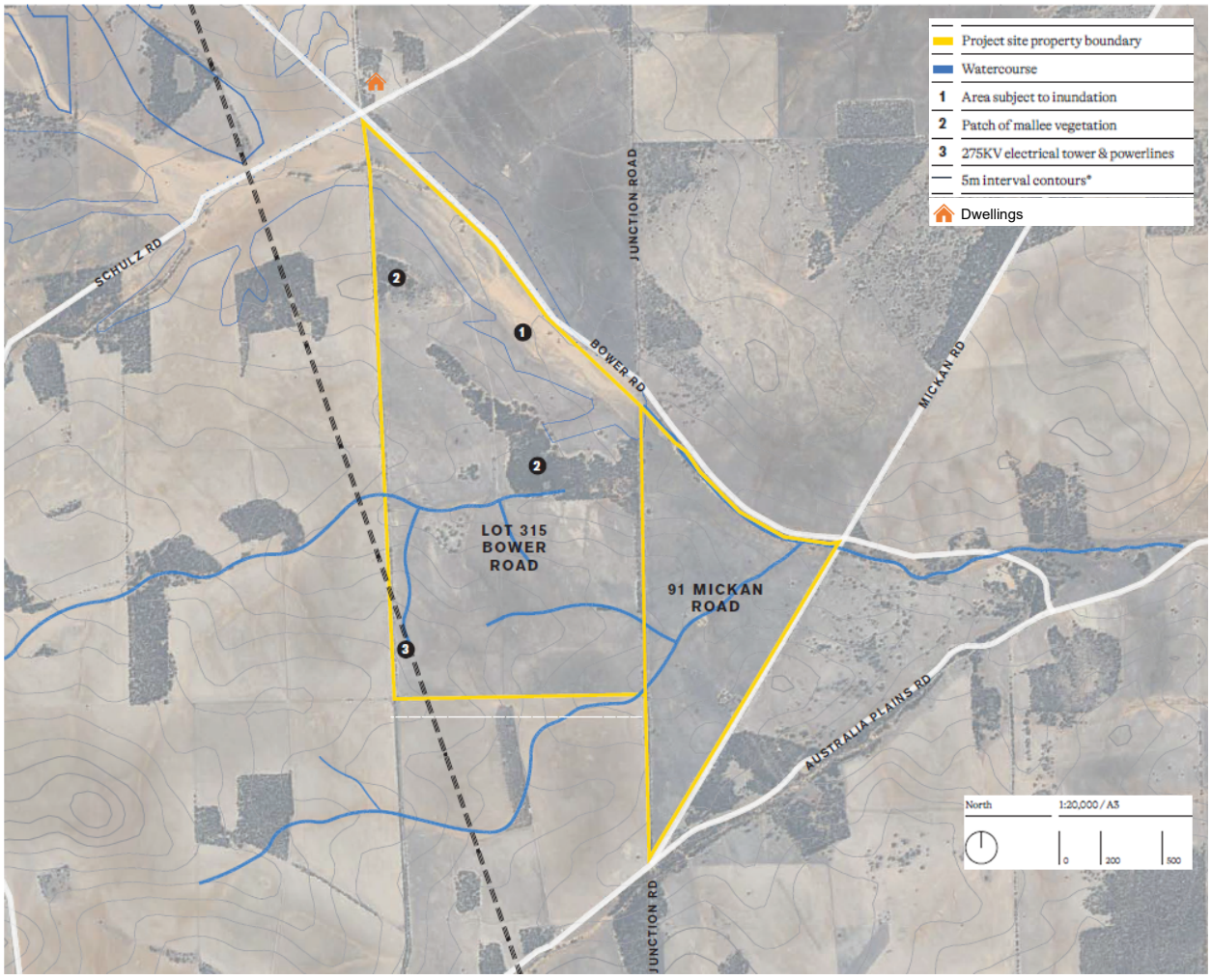


Figure 5: Aerial photo of subject site

3.1 Site Description

The subject site is around 341 ha comprising two irregularly shaped allotments. The site is bounded by Bower Road to the north, Mickan Road to the east and private agricultural land to the south and west. Junction Road separates the two allotments, however the road is unmade and not open to the public.

The site is accessible by Bower Road and Mickan Road, both unsealed roads managed by Council. The nearest major / State sealed roads are Worlds End Highway to the west and Thiele Highway to the south.

The site is relatively flat, with a gradient of 2-5% sloping from southwest to a low point in the northeast. Seasonal watercourses are located within the site and along the northern boundary, with an observable area subject to inundation during high rain events along the northern boundary (shown in Figure 6).

The land has been used for grazing and marginal cropping, with remnant stands of native vegetation. Existing vegetation is characterised by Chenepod scrubland. Stands of mallee eucalypts are located along the site boundary and a large patch (approx. 55ha) is located at the centre of the site.

An easement providing for an existing 275kV overhead transmission power line with 50 metre towers extends across the south-west corner of the site.

Figure 6: Aerial view Lot 315 Bower Road (Source: WGA)

3.2 Locality

The site is located approximately 125 km north-east of Adelaide in South Australia's Mid North Region. The nearest townships are Robertstown, located 10.5 kilometres north-west of the site (population 223 at 2021 Census) and Eudunda, located 13 km south-west of the site (population 815 at 2021 Census).

The landscape character reflects the semi-arid climate, defined by gently undulating agricultural land, isolated dwellings and outbuildings, and native grasslands interspersed with low shrubs and occasional stands of mallee eucalypts.

There are three (3) dwellings within 2 km site, being:

- 12 Back Road - approximately 150 metres north of the northern boundary of the site
- 1362 Australia Plains Road - approximately 700 metres south of the southern boundary
- 1170 Australia Plains Road – approximately 1.9 kilometres south-west of the site

A further nine (9) dwellings are located between 2km and 3km from the site, the majority located south-west of the site near the intersection of Plains Road and Australia Plains Road.

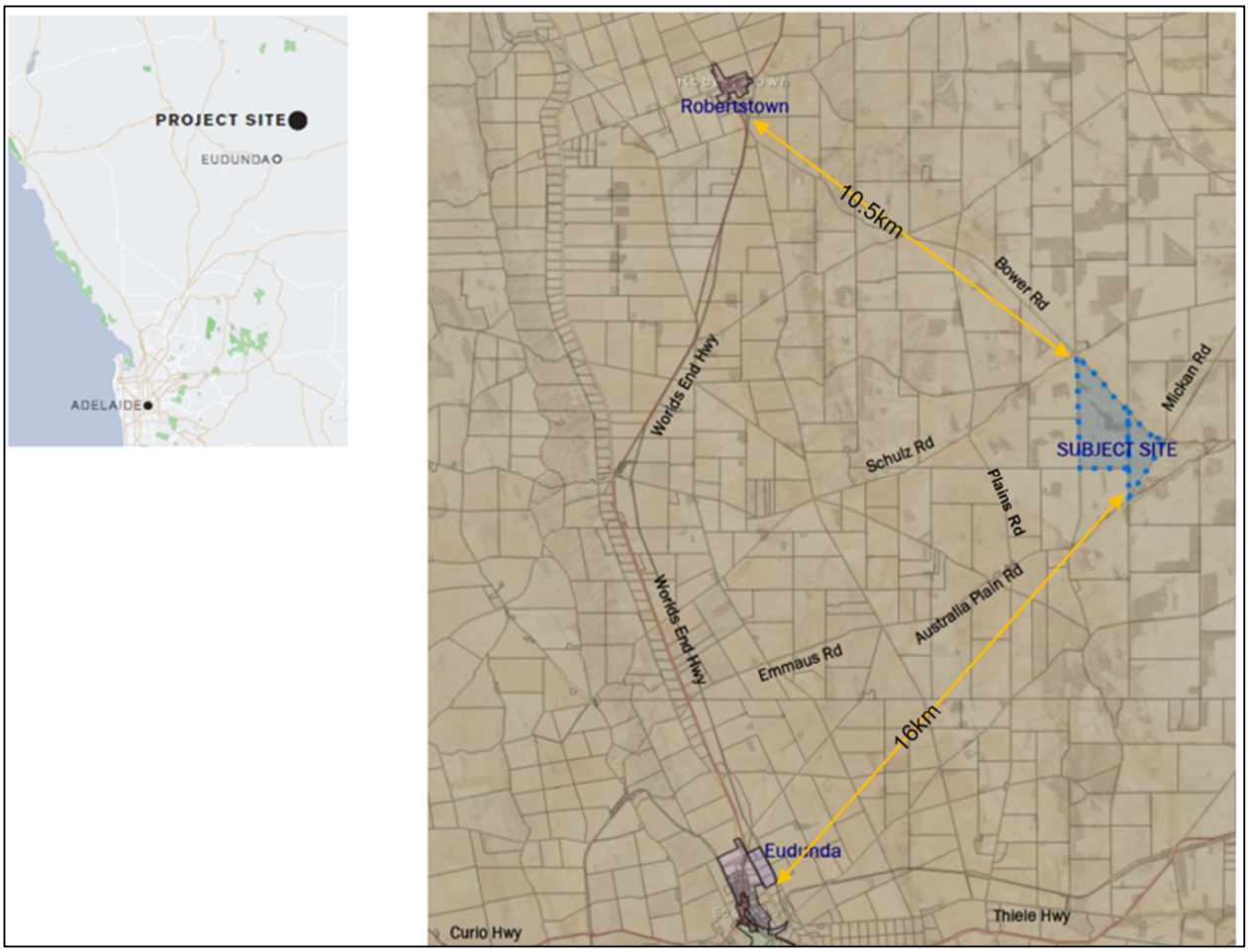


Figure 7: Locality Plan (Source: SAPPA, Landskap)

4. CATEGORY OF DEVELOPMENT

- **PER ELEMENT:**
  Electricity Substation - Performance Assessed – Crown
  Solar Photovoltaic Panels (Ground Mounted) – Performance Assessed - Crown
- **OVERALL APPLICATION CATEGORY:**
  Crown Development
- **REASON**
  Pursuant to section 131 of the Act, Crown sponsorship by the Department for Energy and Mines (sponsorship letters provided at Attachment 1B).

5. DECLARATIONS

Easements or Encumbrances:	✓ YES	Electricity easement south-west corner of Lot 315
State or local heritage:	N/A	No heritage places within or adjacent the site
Electricity Declaration Form:	✓ YES	Office of the Technical Regulator certificate provided
Native Vegetation Declaration Form:	✓ YES	The application is supported by a report prepared in accordance with the Native Vegetation Regulations 2017 that establishes that clearance is categorised as 'low level clearance'

6. STATUTORY REFERRAL BODY COMMENTS

6.1 Regional Council of Goyder

The application was referred to the Council for comment in accordance with r.107(4) of the PDI Regulations. The Council does not object to the proposed development. A copy of the referral response is contained in Attachment 3A.

6.2 Native Vegetation Council

This application was referred to NVC in accordance with s.131(10) of the Act and r.107(5) and Schedule 9 Clause 3 Part A(11) of the PDI Regulations.

The NVC issued an RFI on 27 March 2024 requesting Bushland Assessment Scoresheets and special data defining impacts areas to assist with the assessment. The applicant responded on 28 May 2024.

Following receipt of the applicant's amendment to the scale of the solar array on 1 May 2024, the amendments were circulated to NVC for consideration in preparing their referral response. The NVC issued an RFI on 9 August 2024 requesting an updated Native Vegetation Data Report and associated Bushland Assessment Scoresheets, in light of the larger clearance footprint than was originally applied for. The applicant responded on 12 August 2024.

The NVC issued an RFI on 19 August 2024 requesting an updated Native Vegetation Data Report and associated Bushland Assessment Scoresheets and SEB Management Plan, in light of the SEB requirement changing from payment to being split between part on-ground and part payment. The applicant responded on 10 September 2024.

The Native Vegetation Council does not object to the proposed development subject to conditions relating to compliance with the requirements of the *Native Vegetation Act 1991* and construction management. A copy of the referral response is contained in Attachment 3B and discussed further in the assessment of the application.

7. INFORMAL / TECHNICAL REFERRAL BODY COMMENTS

7.1 Commissioner of Highways (CoH)

This application was referred to the CoH for technical advice on potential impacts on the functional performance of State Maintained Roads, as the proposed construction haul routes include intersections with State Maintained Roads (Worlds End Highway, Thiele Highway).

The CoH supports the development and recommends five (5) conditions relating to access, determination of the preferred haulage route, intersection upgrades, and traffic and stormwater management. A copy of the referral response is contained at in Attachment 3C and is discussed further in the assessment of the application.

7.2 Country Fire Service

This application was referred to the Country Fire Service for technical advice given the nature and location of the proposed development. Utility scale renewable energy projects assessed under the Crown s.131 pathway are routinely referred to CFS for comment.

The CFS did not raise any objections and provided advice on mitigation measures relevant to fire risk and response capability, including Asset Protection Zones, design of access points and internal roads, vegetation management, water supply and emergency response planning.

A copy of the referral response is contained in Attachment 3D and is discussed further in the assessment of the application.

8. PUBLIC NOTIFICATION

8.1 Reason

Pursuant to s.131(13) of the Act, a Crown development application where the total construction cost exceeds $10 million must undertake public notification. The development cost is $520 million.

The application was notified for 21 business days between 16 May 2024 and 14 June 2024. A public advertisement was placed in the Adelaide Advertiser and the Barossa Leader, and physical signs were erected on the subject land along all road frontages. The applicant provided photographic evidence of placement of the signs of the land and verified that the signs remained in place for the duration of the public notification period.

Application details were displayed on PlanSA's online planning portal, at the principal office of Planning and Land Use Services division of the then Department for Trade and Investment, and at Council offices at Burra and Eudunda.

8.2 Representations and Applicant Response

Sixteen (16) representations were submitted during the public notification period, all opposing the development. Of the representors:

- The majority (14) are property owners who live and/or own land in the immediate vicinity of the subject site (Eudunda / Australia Plains)
- One (1) is the local State Member of Parliament (Penny Pratt, Member for Frome) writing in support of a constituent, Mr Desmond Traeger who lives directly adjacent to the subject site
- One (1) is a researcher based in Adelaide concerned about the impact on endangered species (Pygmy Blue-Tounge Lizard).

A copy of the representations and applicant's response are provided in Attachments 4A and 4B and summarised below.

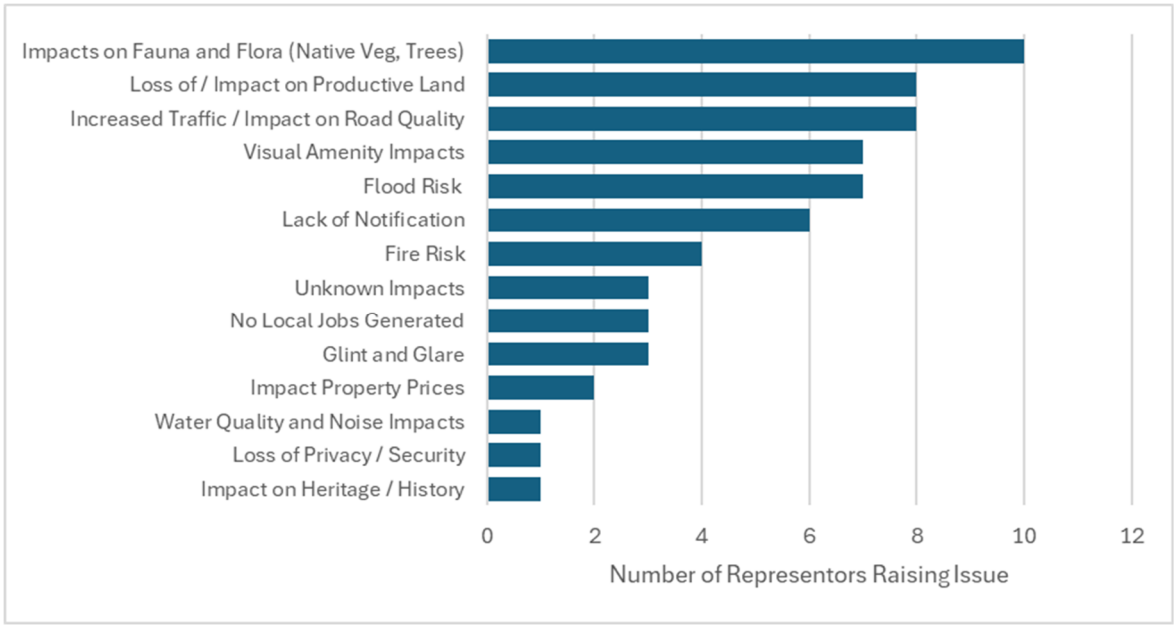


Figure 8: Summary of Issues Raised by Representors

Issues Raised	Applicant Response
Impacts on Fauna and Flora (Trees, Native Vegetation) • Threatens habitat of the pygmy blue tongue lizard that is an endangered species classified by the International Union for Conservation of Nature – land management practices should accord with the relevant management plan • Security fencing and removal of native vegetation will impact native wildlife • Removal of native trees unacceptable as other landowners are not permitted to • Clearing of native vegetation and ground cover will contribute to erosion, water courses and flood damage to roads and fences	The establishment of the solar farm will necessitate the removal of trees and vegetation. The proposal has been assessed by EBS ecology and the necessary approvals are being sought through the Native Vegetation Council for the removal. Notwithstanding this, the proposal has been designed to maintain and keep as much of the existing vegetation as possible. It also includes the incorporation of additional screening vegetation of approximately 5 metres in width around the perimeter of the subject land.
Loss of / Impact on Productive Land • Panels will cover up productive land stopping food production • Concern regarding long term impacts on crops and livestock of the panels due to glare, heat generation, solar radiation etc. • Will ruin farming industry • Biosecurity risks from outside contractors during construction	Whilst the solar array will be located within productive land, establishment of the panels will allow the subject land to be used for grazing of sheep. Whilst it will be given up from cropping, the use will not entirely sterilise the land from primary production.
Increased Traffic / Impact on Road Quality • Road is 'bush track' and poorly maintained at present • Damage to poorly maintained roads by heavy vehicles and contractors during construction will cause dust hazards and erosion during rain events • Security conscious neighbours concerned about random vehicles visiting the area • Deterioration of roads due to traffic affecting amenity and vehicles, roads not graded now and will become powder causing dust and rocks ruining houses and vehicles	No comment
Visual Amenity Impacts • Solar farm in farming and residential area will destroy our peace and environment • Can be seen from road and other areas of our farm, not sympathetic to natural bushland surrounds • Solar facilities are an eyesore to look at • Will impact on neighbours and rural amenity	A visual impact and landscape assessment undertaken by Landskap has identified that the landscape character of the local area is highly modified. It is characterised by dryland agriculture, areas of mallee, high-voltage overhead power lines and agriculture outbuildings. Landskap have assessed the landscape character of the local area to be "… of relatively low scenic quality." On this basis they have concluded that the proposal will have a low visual impact on the locality due to: • Publicly accessible views of the proposal are extremely limited and generally include roads immediately bordering the site, as well as longer distance views on shorter sections of Bower Rd, Mickan Rd and Australia Plains Rd north of site. • The gently undulating topography and scattered stands of mallee restrict views, giving the local area good capacity to absorb the proposed infrastructure • Retention of existing areas of mallee within and bordering the site restrict views • Proposed landscaping around the entire perimeter will screen the facility from adjacent roads and private allotments.

Issues Raised	Applicant Response
	• The proposed substation and BESS are consolidated and well located to minimize visual impact. • The local areas comprises large allotments with scattered dwellings and outbuildings, with few dwellings adjacent the project site. • Whilst the photographic survey was not undertaken from private properties, a desktop review found: o 12 Back Road, Rocky Plain – located approximately 150m from the northern project site boundary is the closest dwelling. Based on photographic survey undertaken from Schulz Road, adjacent to the dwelling, the following are noted: - the northern portion of the proposal will be partially visible from the dwelling. Views will be significantly obstructed by existing vegetation adjacent the dwelling and along Bower Road, as well as proposed vegetation along the project site boundary. - views to the southern portion of the proposal, including substation and BESS will be obstructed by existing topography and mallee stands within the project site. o 1362 Australia Plains Road, Australia Plains - located 700m south of the southern boundary. Based on photographic survey undertaken from Junction Road, adjacent the dwelling, it is anticipated that the proposal will not be visible due to local topography and vegetation. o 1170 Australia Plains Road, Australia Plains - located 2,000m south of the southern project site boundary. Based on photographic survey undertaken from Australia Plains Road, it is anticipated that the proposal will not be visible due to local topography and vegetation. o 1140 Australia Plains Road, Australia Plains - located 2,150m south of the southern project site boundary. Based on photographic survey undertaken from Australia Plains Road, it is anticipated that the proposal will not be visible due to local topography and vegetation. o 1041 Australia Plains Road, Australia Plains - located 2,250m south-west of the southern project site boundary. Based on photographic survey undertaken from Plains Road, it is anticipated that the proposal will not be visible due to local topography and vegetation. • Due to local topography some long-distance views to the proposal may be possible from private allotments to the east and north, however anticipate that these views will be significantly limited by the local topography, existing vegetation and proposed landscaping. • Landskap have concluded that "… the visual impact of the proposal will be low and will lessen over time. It is our opinion that it will not result in an unacceptable visibility that compromises the landscape character of the locality. The successful establishment of proposed landscaping will provide visual and landscape benefit to the local area."
Flood Risk • North-east of site is prone to flooding during heavy rainfall, eroded dry creek beds are evident on site • Potential flooding and damage to fencing, land and roads downstream of the facility, exacerbated by clearance of vegetation and ground cover	Development of the proposed solar farm will result in additional hard surfaces that have the potential to increase in water flows during rainfall events. To this end the proposal has incorporated a number of detention basins and swales throughout the site to mitigate the potential impact of flooding and erosion on the site. Full details of the proposed design and layout of the swales and detention basis is included in the Stormwater Assessment that was submitted as part of the development application.

Issues Raised	Applicant Response
Lack of Notification • Only became aware of proposal through notice in local paper and/or when sign erected • As an adjoining owner through I would receive written notification • Would have liked to be contacted by mail and a community meeting held, many people do not rely on newspapers	The proposal involved a community open day in August 2020, where 38 people attended. At this event attendees were provided with information about the solar farm and the proponent and were shown a number of images of similarly-scaled solar farm developments to provide a reasonably accurate picture of what the proposed development would look like on completion. The community event was held at a time when the subject site included Lot 309 Emmaus Road. Residents in close proximity to the southern boundary of this allotment attended the open day to register their opposition to the proposal, expressing concerns over the visual impact of the solar farm and its "incompatibility" within a predominantly rural / primary production setting. Remaining participants were generally supportive of the development on the condition that any adverse impacts would be carefully managed. The application was subsequently placed on formal public notification under the provisions of the *Planning, Development and Infrastructure Act, 2016.* In addition, direct contact was made with a number of representors in an attempt to allay concerns.
Fire Risk • How will homes, farms be protected if fire started at the solar facility?	The proposal includes the installation of water tanks for fire-fighting purposes (with the precise number and location to be determined in liaison with the CFS). Installation of the solar array per se is not considered to exacerbate nor aggravate the likelihood for bushfire on the site. Installation of fire protection systems on the site will assist to reduce the effects of bushfire on the subject land.
Unknown Impacts • Will the facility interfere with appliances, i.e. digital phones, satellite, internet? • What are long term health risks to people and livestock	There is no supporting evidence to support the assertion that a solar farm has the potential to impact any of the suggested matters.
No Local Jobs Generated	No comment
Glint and Glare • Glare from the panels are a road safety issue • Panels can be seen from road and other areas of our farm	A glint and glare assessment undertaken by Environmental Ethos (using the Solar Glare Hazard Analysis Tool (SGHAT 2024A) and viewshed analysis) found: • no aviation facilities within 5km and no railway infrastructure within 1km of the Project. • Within 3km of the proposal, nine residential receivers were identified to have a potential line of sight to the proposal (based on the terrain model). • The viewshed modelling identified the five (5) local roads as having potential line of sight to the proposal and an unformed road corridor. • Glare modelling identified that under normal operation of the solar farm with a tracking/backtracking operation and a minimum limit of 5-degree resting angle (being the fixed angle at which the backtracking process starts and finishes during daylight hours), no potential glare hazard impacts were identified as affecting residential receivers within 3km of the subject site. • Glare modelling identified no potential glare hazard affecting Bower Road, Back Road, and Australia Plains / Emmaus Roads. • PV Array 5 (located to the east of the subject site) was identified as generating a small amount of glare that has the potential to affect Mickan Road and a very small amount of glare affecting Schulz Road, when the resting angle was set at 5 degrees. Adjustment to a 6 degrees resting angle eliminated potential glare in the modelling, therefore the mitigation measures for PV Array 5 includes the

Issues Raised	Applicant Response
	requirement to limit the resting angle of the tracking system to a minimum 6 degrees. • Glare modelling identified potential glare affecting the unformed road corridor (Junction Road) generated by PV Arrays 3 and 5. As the Project will curtail access along the road corridor during the life of the Project, the potential glare identified in the modelling is unlikely to affect drivers of vehicles. • Screen planting and the retention of areas of existing vegetation, and in particular when the screen planting has become established to a height and density sufficient to block line of site to the subject site from Mickan Road and Schulz Road, the requirement to limit the resting angle of the tracking system for PV Array 5 to 6 degrees (minimum) would no longer be necessary. On this basis Environmental Ethos has recommended that the Environmental Management Plan (EMP) associated with the project should detail glare management measures required to mitigate impacts to sensitive receptors, regarding resting angles. It also recommends the monitoring of glare hazard potential for managing complaints, including rectification, for inclusion in the in the Project EMP.
Impact Property Prices • Solar farms are making farm land more expensive, leading to high council rates for farmers – companies should also pay council rates	The subject of the increasing cost of land is a land economics consideration that generally cannot be dictated to by the planning approvals system.
Water Quality and Noise Impacts	No comment
Loss of Privacy / Security • Concerned about security cameras overlooking neighbouring properties	No comment
Impact on Local Heritage / History of the district for those who still live and farm the land	No comment

In response to the question 'What could be done to address your concerns?' many of the representors that live in the local area asked that the solar farm not be built at Australia Plains. A letter submitted by the Lewis family on behalf of residents stated: "*We do not want a solar farm on our local rural area. For the development to not go ahead and the land in question continue to be used as grazing area in line with all the other surrounding land use at this present time. For solar farm developers to make more appropriate choices for their development sites far away from local residents who will be subjected to the stress of having to live with this and its unknown effects for the long term*."

9. POLICY OVERVIEW

9.1 Mid North Regional Plan (2011)

Australia Plains is located in the south-west of region, with the main land use being primary production centring on livestock grazing and marginal cropping. The area is bisected by Goyder's Line and the state's electricity transmission network. The Plan recognises the susceptibility of this part of the region to climate change impacts and provides directions to support ongoing prosperity and sustainability:

- Making best use of the region's strategic electricity transmission infrastructure by identifying land suitable to accommodate renewable energy development (Policy 5.7).
- Retaining the economic potential of primary production land, including by supporting renewable energy in appropriate locations co-located with agriculture land (Policy 6.12).
- Protecting and restoring the region's environmental assets (Principle 1).
- Creating the conditions to adapt and become resilient to the impacts of climate change, including through development of alternative energy generation (Policy 4.4).

9.2 State Planning Policies (SPP)

SPP 4 *Biodiversity* seeks to maintain and enhance South Australia's biodiversity and life supporting functions by minimising impacts on biodiversity (Policy 4.1), recognising the value of appropriately scaled development that can co-exist with and safeguard biodiversity values (Policy 4.2) and where impacts cannot be avoided, minimising and offsetting impacts (Policy 4.5).

SPP 5 *Climate Change* seeks to ensure development is resilient to, and mitigates the impacts of, climate change, including by facilitating green technologies and industries that reduce reliance on carbon-based energy supplies (Policy 5.6).

SPP 8 *Primary Industry* recognises that primary industries are fundamental to South Australia's prosperity and identity, and seeks to ensure a diverse and dynamic primary industry sector, including by managing the interface between primary production and other land use types (Policy 8.4).

SPP 12 *Energy* aims to support the ongoing provision of sustainable, reliable and affordable energy options including through development of energy assets and infrastructure where the impact on surrounding land uses, regional communities and the natural built environment can be minimised (Policy 12.1) and facilitation of energy technologies that support a stable energy market and continued energy supply and do not adversely affect the amenity of regional communities (Policy 12.6).

9.3 ZONING AND OVERLAYS

Planning and Design Code (the Code) policies applicable at the start of assessment are contained in **Appendix 1B and 1C** and summarised below. Part 9 of the Code states that any additional referrals are triggered by overlays, and where relevant these are noted below.

The subject site is located within the **Rural Zone** (Figure 9, Attachment 2B) and the following Overlays apply:

- Native Vegetation
- Water Resources
- Hazards (Bushfire – Regional)
- Hazards (Flooding – Evidence Required)
- Water Resources (*not relevant to assessment*)

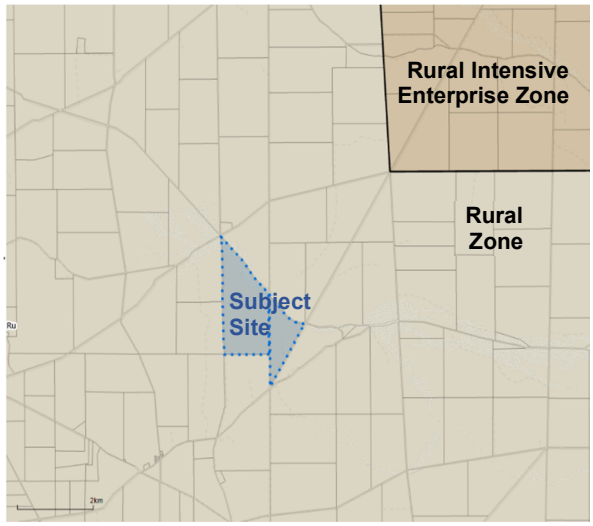


Figure 9: Zoning (Source: SAPPA)

9.3.1 Rural Zone

The Rural Zone seeks to support the state's economic prosperity through a range of primary production, forestry and renewable energy activities and associated value-adding (DO1, DO2).

Renewable energy facilities are envisaged in the zone where they minimise significant fragmentation and displacement of existing primary production (PO9.1).

9.3.2 Native Vegetation Overlay

This Overlay seeks to protect, retain and restore native vegetation in order to sustain biodiversity, threatened species and vegetation, fauna habitat, ecosystem services, carbon storage and amenity values (DO1). A referral to the NVC was issued.

9.3.3 Hazards (Bushfire - Regional) Overlay

This Overlay seeks development to be sited and designed to mitigate the threat and impact of bushfires on life and property (DO1) and facilitate access for emergency service vehicles (DO2). A referral to the CFS was issued.

9.3.4 Hazards (Flooding – Evidence Required) Overlay

This Overlay seeks to mitigate potential flood risks impacting on people, property, infrastructure and the environment by ensuring development is appropriately sited and designed (DO1).

9.3.5 Water Resources Overlay

This Overlay seeks to protect the quality of surface waters and maintain the natural flow of watercourses to assist in the management of flood water and stormwater runoff (DO1, DO2).

9.4 GENERAL DEVELOPMENT POLICIES

The following General Development Policies are particularly relevant for this development.

9.4.1 Clearance from Overhead Powerlines

The proposed development is in proximity to an ElectraNet 275kV powerline. This policy requires development in the vicinity of overhead powerlines to be undertaken in a manner that minimises potential hazard to people and property (DO1, PO1.1).

9.4.2 Infrastructure and Renewable Energy Facilities

These policies seeks to achieve efficient provision of infrastructure, renewable energy facilities and ancillary development in a manner that minimises hazards, is environmentally and culturally sensitive and manages adverse visual impacts on natural and rural landscapes and residential amenity.

Specific Performance Outcomes applicable to new solar facilities aim to mitigate fire hazard risks (PO4.1, 4.3); avoid the need for extending transmission infrastructure (PO7.1); facilitate the movement of wildlife (PO9.2); manage interface impacts on adjacent land uses (PO1.1, 9.3, 9.4, 13.1, 13.2); and minimise visual impacts from townships, scenic routes and public roads (PO2.1, 2.2).

9.4.3 Interface between Land Uses

These policies require development to be located and designed to mitigate adverse effects on or from neighbouring and proximate land uses (DO1, PO1.2), including with respect to:

- Noise - ensuring development that emits noise does not unreasonably impact the amenity of sensitive receivers (or lawfully approved sensitive receivers) (PO4.1) – DPF 4.1 Noise that affects sensitive receivers achieves the relevant Environment Protection (Noise) Policy criteria
- Lighting - ensuring external lighting is positioned and designed to not cause unreasonable light spill impact on adjacent sensitive receivers (or lawfully approved sensitive receivers) (PO6.1)
- Glare - ensuring that development is designed and comprised of materials that does not unreasonably cause a distraction to adjacent road users or heat loading and micro-climatic impact on adjacent land uses as a result of reflective solar glare (PO7.1).
- Temporary Facilities – ensuring siting and operation minimises impacts (PO13.1, 13.2)

9.4.4 Design

These policies aim to ensure development is contextual, durable, inclusive and sustainable by:

- Incorporating landscaping and tree planting to minimise heat effects, maximise shade and shelter, maximise stormwater infiltration and enhance amenity and biodiversity (PO3.1)
- Using locally indigenous species best suited to the climate conditions in soft landscaping and tree planting, and avoids pest plant and weed species (PO3.2)
- Siting development to maintain natural hydrological systems (PO5.1).

9.4.5 Transport, Access and Parking

Development should support a safe, sustainable, efficient, convenient, accessible and connected transport system (DO1) by:

- Ensuring integrated with the existing transport system and designed to minimise its potential impact on the functional performance of the transport system (PO1.1)
- Sightlines at intersections and crossovers to allotments for motorists, cyclists and pedestrians are maintained or enhanced to ensure safety for all road users and pedestrians (PO2.1)
- Ensuring access points are designed to accommodate the projected type and volume of traffic generated by the development or land use (PO3.3) and minimise impacts on neighbouring properties (PO3.4).

10. PLANNING ASSESSMENT

In accordance with the Crown assessment pathway, the application has been assessed against the relevant provisions of the Code (see **Appendix 1)** and other planning instruments where relevant.

10.1 Land Use

The Rural Zone envisages the establishment of renewable energy facilities alongside primary production-related activities to support the economic prosperity of South Australia. The zone policies seek the retention of productive value of rural land by ensuring renewable energy facilities (and ancillary development) minimise significant fragmentation or displacement of existing primary production (PO 9.1).

Similarly, while the General Policies – Infrastructure and Renewable Energy Facilities envisage renewable energy facilities in locations close to existing transmission infrastructure (PO7.1) (to minimise the impacts of new transmission infrastructure), they also seek to ensure such facilities minimise hazard or nuisance to adjacent land uses (PO1.1). The subject site is adjacent a 275kV transmission line.

The assessment needs to balance the primary production land use potential (opportunities and constraints) for the site against the co-location benefits of siting renewable energy facilities in proximity to existing or planned transmission lines and storage facilities. The 352 hectare subject site is in proximity to Goyder's line and has historically been used for low-density grazing with some marginal cropping. The productivity of the northern part of the site is compromised due to inundation and erosion during high rainfall events.

Several representors expressed concerns that the solar panels would occupy productive farm land. They are also concerned about the potential long term adverse impacts on neighbouring cropping, pastures and sheep production through solar radiation, heat island effects and/or glare from the panels.

In their response to representors, the applicant advised that the design of the panels will allow the subject site to be continued to be used for sheep grazing. They also noted that there is no evidence to support the assertion that a solar farm has the potential to impact neighbouring primary production activities.

Studies have shown that the 'heat island' effect from solar arrays are localised within 30 metres of the panels and the use of setbacks from property boundaries should prevent impacts on neighbouring uses, such as cropping. The Code recommends a 30 metre setback to ensure that any potential impacts from this affect are fully contained within a solar development site, although a lesser distance could be considered based on existing vegetation, roadways or similar buffer feature to neighbouring land.

The applicant proposes a minimum setback of 30 metres and retention and enhancement of vegetation bordering the site. A condition of approval is recommended to ensure this is reflected in the final design.

Based on the above assessment, the proposed development is consistent with the intent of the zoning, not anticipated to change the current rural land use of the immediate area and would not have an adverse impact on the continuation of primary production activities in the immediate vicinity.

10.2 Siting, Design and Appearance

The Rural Zone is silent on design and appearance in relation to renewable energy facilities, however the 'Infrastructure and Renewable Energy Facilities' module provides the following guidance:

- Minimising adverse visual impacts, including through landscaping and vegetation buffers on boundaries; using natural landscape features and existing vegetation for screening (PO2.1, 2.2) and avoiding land of high environmental, scenic or cultural value (PO9.1).
- Minimising the development footprint and environmental impacts by co-locating substation, battery storage, transmission and ancillary infrastructure where practicable (PO5.1, 5.3, 7.1).
- Managing amenity impacts through setbacks and landscaping adjacent road frontages and boundaries of adjacent allotments featuring dwellings, where balanced with bushfire safety considerations and infrastructure access. (PO9.3, 9.4).

The proposed substation and associated electricity infrastructure and water tanks will occupy around 5 ha in the southwest corner of the site (Figure 3). This infrastructure will be co-located with the existing 275kV overhead line and the new BESS (not subject to this application) to minimise the footprint.

The solar arrays are proposed to comprise around 4000 rows of trackers spaced 6 metres apart, covering an estimated 223 ha of the site. The tracking system will be ground mounted, single axis in a north-south alignment and east-west rotation, with an estimated maximum height at full rotation of 3.83 metres. The final selection and staging of infrastructure depends on several factors including suitability for the subject land, relative cost, maintenance requirements, efficiency and reliability of units available on the market at the time of detailed design. A condition regarding final layout and design drawings prior to commencement of construction of each stage is recommended to be attached to any approval granted.

The substation facility, and the broader site, will be bordered by a 2.3 metre high security fencing (1.8 metre chain wire mesh with three strand barbed wire top or similar) incorporating CCTV devices on 2.5 metre poles directed at the infrastructure assets (Figure 4). The fencing and remote monitoring is required for security, public safety and insurance purposes and is consistent with an expansive rural landscape.

PO9.3 provides guidance on separation from sensitive receivers and suggests a setback from adjoining land boundaries of 30 metres for solar power facilities greater than 50MW. As shown in Figure 1, the proposal includes the following buffers and setbacks:

- A landscape buffer of 5 metres around the entire perimeter of the site.
- An Asset Protection Zone (APZ) of 30 metres between the perimeter fence and project infrastructure in accordance with fire management requirements and PO 9.3.
- A setback of up to 200 metres along the northern boundary to accommodate areas subject to inundation, including vegetated basin and swales.

A Visual Impact Assessment (VIA) (Attachment 1J) undertaken by Landskap considered the potential visual impact and mitigation measures, including landscaping. The viewshed analysis from neighbouring properties and public roads is shown in Figures 11 to 17. The assessment concluded that the local area is of relatively low scenic quality. The visual impact of the proposal is expected to be low and will lessen over time as proposed landscaping matures, providing visual and landscape benefit to the local area.

The proposed development does represent a significant change to the appearance of the subject site. However, as evidenced in the VIA, the local topography, existing vegetation (on and off site), proposed setbacks and perimeter landscaping are expected to limit the visual impact to an acceptable level.

The proposal is considered acceptable in terms of the overall visibility and locational context within an expansive rural landscape.

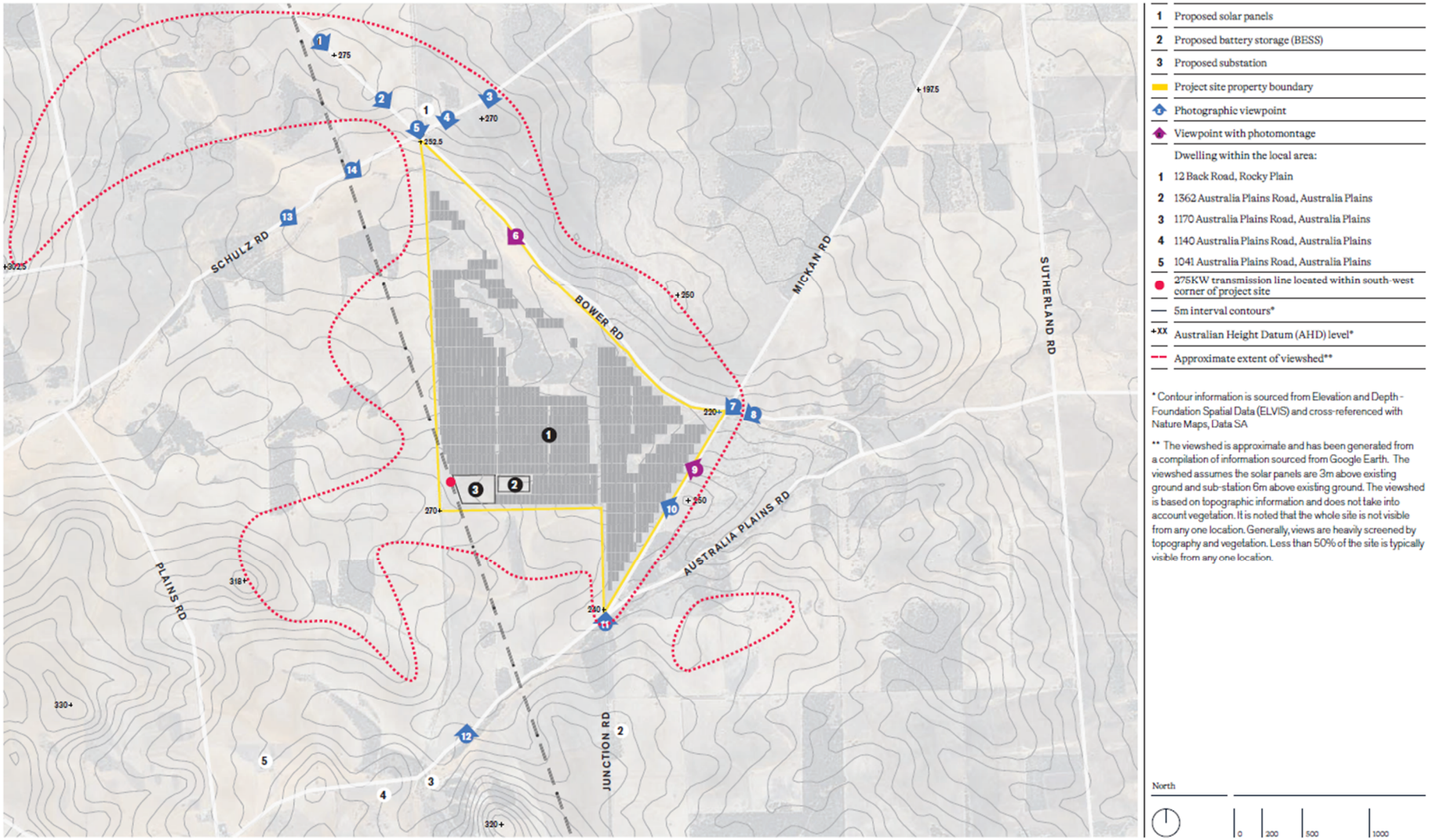
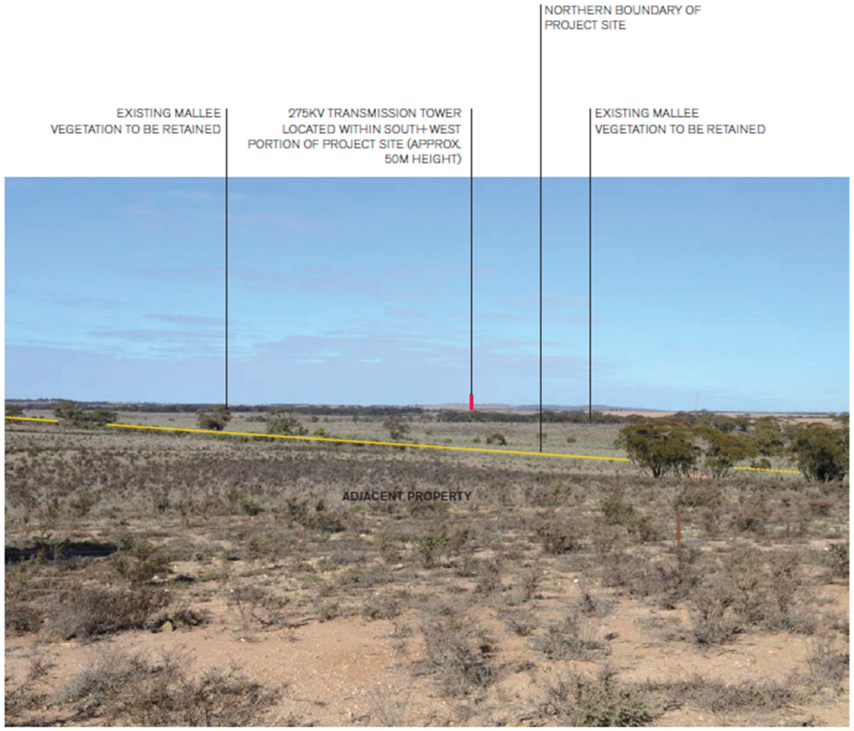


Figure 10: Viewshed Analysis

VIEWS FROM SCHULZ RD LOOKING SOUTH TOWARDS THE NORTHERN BOUNDARY OF THE SUBJECT SITE - EXISTING



VIEWPOINT 04

Location	Schulz Road, Rocky Plain
Distance from the site	250m
Distance from nearest solar panel	550m
Date & time	04.07.2024 - 10:00am
Image modifications	None
Visual notability	High
Visual impact	High

Notes

- The northern portion of the site, including solar panels, will be visible from this viewpoint.
- The southern portion of the site will be screened by existing mallee vegetation within the site.

Figure 11: Viewpoint 4 – from Schulz Rd looking south

VIEWPOINT 05

Location	Intersection of Bower Road & Schulz Road, Rocky Plain
Distance from the site	50m
Distance from nearest solar panel	450m
Date & time	04.07.2024 - 10:00am
Image modifications	None
Visual notability	Low
Visual impact	Low

Notes

- The majority of the site will be screened from view by existing vegetation.

Figure 12: Viewpoint 5 – from Bower Rd & Schulz Rd looking south

VIEWS FROM AUSTRALIA PLAINS RD LOOKING NORTH TOWARDS THE SOUTHERN BOUNDARY OF THE SUBJECT SITE – EXISTING

VIEWPOINT 11

Location	Intersection of Australia Plains Road & Mickan Road, Australia Plains
Distance from the site	40m
Distance from nearest solar panel	220m
Date & time	04.07.2024 - 10:10am
Image modifications	None
Visual notability	High
Visual impact	High

Notes

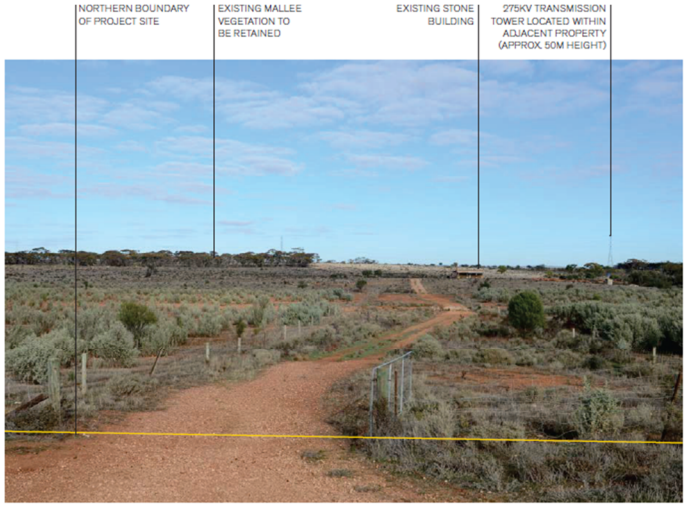
- Views to the solar panels will uninterrupted from this viewpoint.
- The sub-station and BESS will not be visible from this viewpoint due to topography and existing vegetation.

Figure 13: Viewpoint 11 – from Australia Plains Rd & Mickan Rd looking north

VIEWPOINT 12

Location	Australia Plains Road, Australia Plains
Distance from the site	1,600m
Distance from substation	1,700m
Date & time	04.07.2024 - 10:10am
Image modifications	None
Visual notability	Negligible
Visual impact	Negligible

Figure 14: Viewpoint 12 – from Australia Plains Rd looking north



VIEWPOINT 06 - EXISTING

Location	Bower Road, Australia Plains
Distance from the site	10m
Distance from nearest solar panel	250m
Date & time	04.07.2024 - 10:00am
Image modifications	None
Visual notability	High
Visual impact	High

Notes

- The northern portion of the site, including solar panels, will be visible from this viewpoint.
- The southern portion of the site will be screened by existing mallee vegetation within the site.

VIEWPOINT 06 - 3 YEARS OF GROWTH*

Location	Bower Road, Australia Plains
Distance from the site	10m
Distance from nearest solar panel	250m
Date & time	04.07.2024 - 10:00am
Image modifications	Yes, fence, vegetation and solar panels included
Visual notability	Moderate
Visual impact	Moderate

1. Proposed 5m vegetated buffer
2. Proposed solar panels
3. Proposed fence

Notes

- The solar panels are represented at their maximum height. The panels tilt to maximise their exposure to the sun and it is anticipated that the panels will generally be positioned lower than represented in the photomontage views.
- Vegetation growth shown is approximate only and based on previous experience and specific planting requirements provided.

VIEWPOINT 06 - 10 YEARS OF GROWTH*

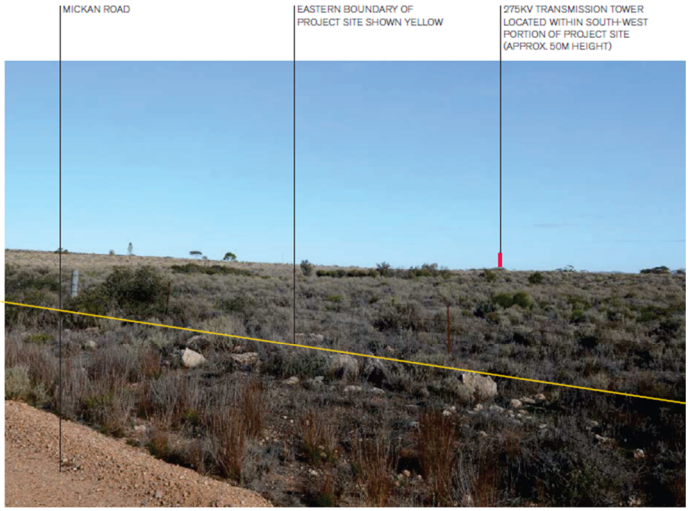
Location	Bower Road, Australia Plains
Distance from the site	10m
Distance from nearest solar panel	250m
Date & time	04.07.2024 - 10:00am
Image modifications	Yes, fence, vegetation and solar panels included
Visual notability	Low
Visual impact	Low

1. Proposed 5m vegetated buffer
2. Proposed solar panels
3. Proposed fence

Notes

- The solar panels are represented at their maximum height. The panels tilt to maximise their exposure to the sun and it is anticipated that the panels will generally be positioned lower than represented in the photomontage views.
- Vegetation growth shown is approximate only and based on previous experience and specific planting requirements provided.

Figure 15: Viewpoint 6 - Bower Road looking south-west – time series photo montage with landscaping



VIEWPOINT 09 - EXISTING

Location	Mickan Road, Australia Plains
Distance from the site	10m
Distance from nearest solar panel	70m
Date & time	04.07.2024 - 10:10am
Image modifications	None
Visual notability	High
Visual impact	High

Notes

- Views to the solar panels will uninterrupted from this viewpoint.
- The sub-station and BESS will not be visible from this viewpoint due to topography and existing vegetation.

VIEWPOINT 09 - COMPLETION OF SOLAR FARM & FENCE

Location	Mickan Road, Australia Plains
Distance from the site	10m
Distance from nearest solar panel	70m
Date & time	04.07.2024 - 10:10am
Image modifications	Yes, fence, vegetation and solar panels included
Visual notability	High
Visual impact	High

1. Proposed 5m vegetated buffer
2. Proposed solar panels
3. Proposed fence

Notes

- The solar panels are represented at their maximum height. The panels tilt to maximise their exposure to the sun and it is anticipated that the panels will generally be positioned lower than represented in the photomontage views.

VIEWPOINT 09 - 3 YEARS OF GROWTH*

Location	Mickan Road, Australia Plains
Distance from the site	10m
Distance from nearest solar panel	70m
Date & time	04.07.2024 - 10:10am
Image modifications	Yes, fence, vegetation and solar panels included
Visual notability	Moderate
Visual impact	Moderate

1. Proposed 5m vegetated buffer
2. Proposed solar panels
3. Proposed fence

Notes

- The solar panels are represented at their maximum height. The panels tilt to maximise their exposure to the sun and it is anticipated that the panels will generally be positioned lower than represented in the photomontage views.
- Vegetation growth shown is approximate only and based on previous experience and specific planting requirements provided.

Figure 16: Viewpoint 9 - Mickan Road looking north-west – time series photo montage

10.3 Biodiversity and Landscaping

The Native Vegetation Overlay applies to the subject land. The overlay seeks to:

- avoid, or where it cannot be practically avoided, minimise the clearance of native vegetation taking into account factors including bushfire protection measures (PO1.1, 1.2), and
- restore and enhance biodiversity and habitat values through revegetation using locally indigenous plant species (PO1.4).

The Infrastructure and Renewable Energy Facilities module (PO9.1, 9.2) of the Code also identifies the need for ground mounted solar power facilities to retain intact native vegetation, allow for wildlife movement and incorporate landscaping within setbacks from adjacent road frontages and boundaries. The Design module of the Code (PO3.1, 3.2) promotes landscaping to minimise heat absorption, maximise stormwater infiltration, enhance the appearance of land and contribute to biodiversity.

Several representors have expressed their aspirations to retain existing native vegetation and trees where possible to support flora, fauna and visual amenity of the site. One representor (Michael Nash) opposed the development stating that the proposal '*threatens the habitat for the pygmy blue tongue lizard that is an endangered species'* under the EPBC Act and *National Parks and Wildlife Act 1972* (NPWA).

The development application includes a Native Vegetation Clearance Assessment (Attachment 1I) and an EPBC Act Self-Assessment (Attachment 1L), both undertaken by EBS Ecology involving desktop research and field surveys of flora and fauna.

Key findings:

- No threatened flora or fauna species or ecological communities will be significantly impacted by this development.
- The assessment did not identify the pygmy blue tongue lizard (*Tiliqua adelaidensis*) as a threatened species potentially located within the subject site.
- Most of the subject site has been historically cleared, with evidence of historic cropping activity and more recent grazing of native pasture.
- Vegetation is generally in poor to moderate condition; remaining mallee has only sparse understory cover with few grass and shrub species.
- Eight vegetation associations were identified on subject land as shown in Figure 17, including Chenopod shrublands, patches of Eucalyptus mallee at the boundaries and through the centre of the site, and a saltbush (*Atriplex spp.*) plantation at the northern boundary.
- As assessment of the likely occurrence of threatened species and risk mitigation identified:
    - 2 threatened ecological communities within the subject area (Plains Mallee Box Woodlands, Mallee Bird Community) – the design avoids clearance of these;
    - 1 threatened flora species as possible to occur on the subject land (Spreading Cress), - however there are no recent records of the species in the subject land; and
    - 5 threatened fauna species as possible, likely or highly likely to occur (Southern Whiteface, White-winged Chough, South-eastern Hooded Robin, Jacky Winter, Blue-winged Parrot) - impacts to be mitigated through retention and restoration of habitat.

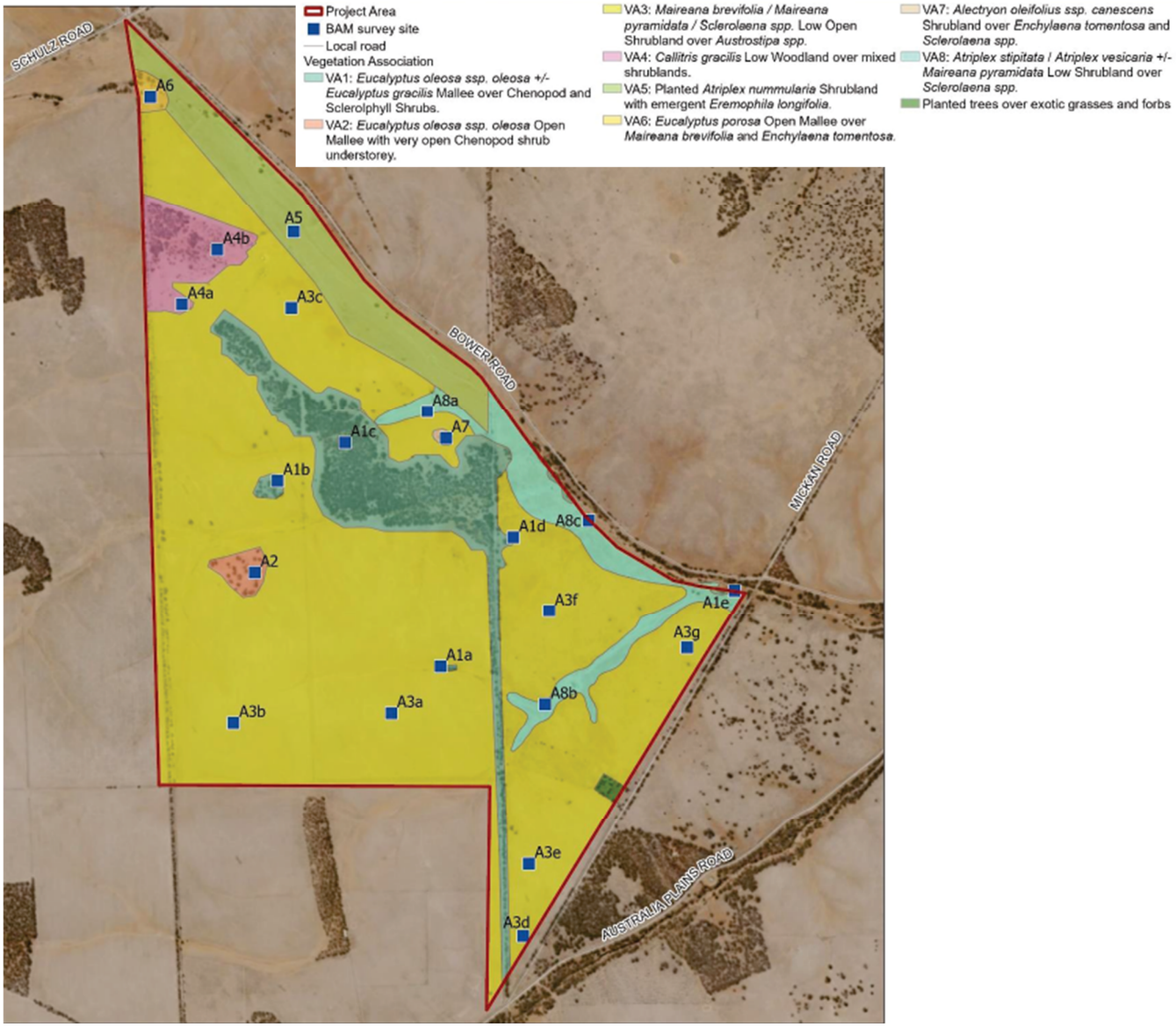


Figure 17: Potential impact areas and vegetation associations identified in field assessment (Source: EBS Ecology)

The applicant proposes to manage potential impacts by applying the mitigation hierarchy as follows:

- Avoidance – as shown in Figure 18, the footprint of the proposed development has been designed to avoid clearance of large areas identified as woodland and mallee, mitigating impacts to habitats supporting fauna species identified as potentially occurring in or near the subject site.
- Minimisation – clearance areas have been limited to areas of more disturbed vegetation or vegetation in the poorest condition. A Construction Environmental Management Plan will be prepared setting out strategies to minimise the impact on flora and fauna.
- Rehabilitation and Restoration – revegetation of low grasses and shrubs using local species is proposed within the solar array footprint following initial construction impact.
- Offset – the applicant proposes a Significant Environmental Benefit offset through a combination of payment into the Native Vegetation Fund and onsite revegetation.

The VIA (Attachment 1J) sets out the proposed landscape approach and strategies as shown in Figure 18. Key strategies include hydroseeding the entire perimeter with local native species and over planting with trees and shrubs; planting within stormwater swales and retention basin batters; and a minimum two year maintenance and establishment period, including automated irrigation.

The retention and enhancement of habitat refuges within the site and use of open wire mesh for perimeter fencing satisfies the intent of Infrastructure and Renewable Energy PO 9.2 with respect to allowing movement of wildlife without unreasonably compromising the security of the facility.

As discussed at 6.2, the NVC does not object to the proposed development and recommends conditions be attached to any approval relating to satisfaction of Significant Environmental Benefit requirements and construction management controls.

Considering the above assessment, the proposed development supports the retention, restoration and enhancement of native habitats consistent with relevant Code policies.

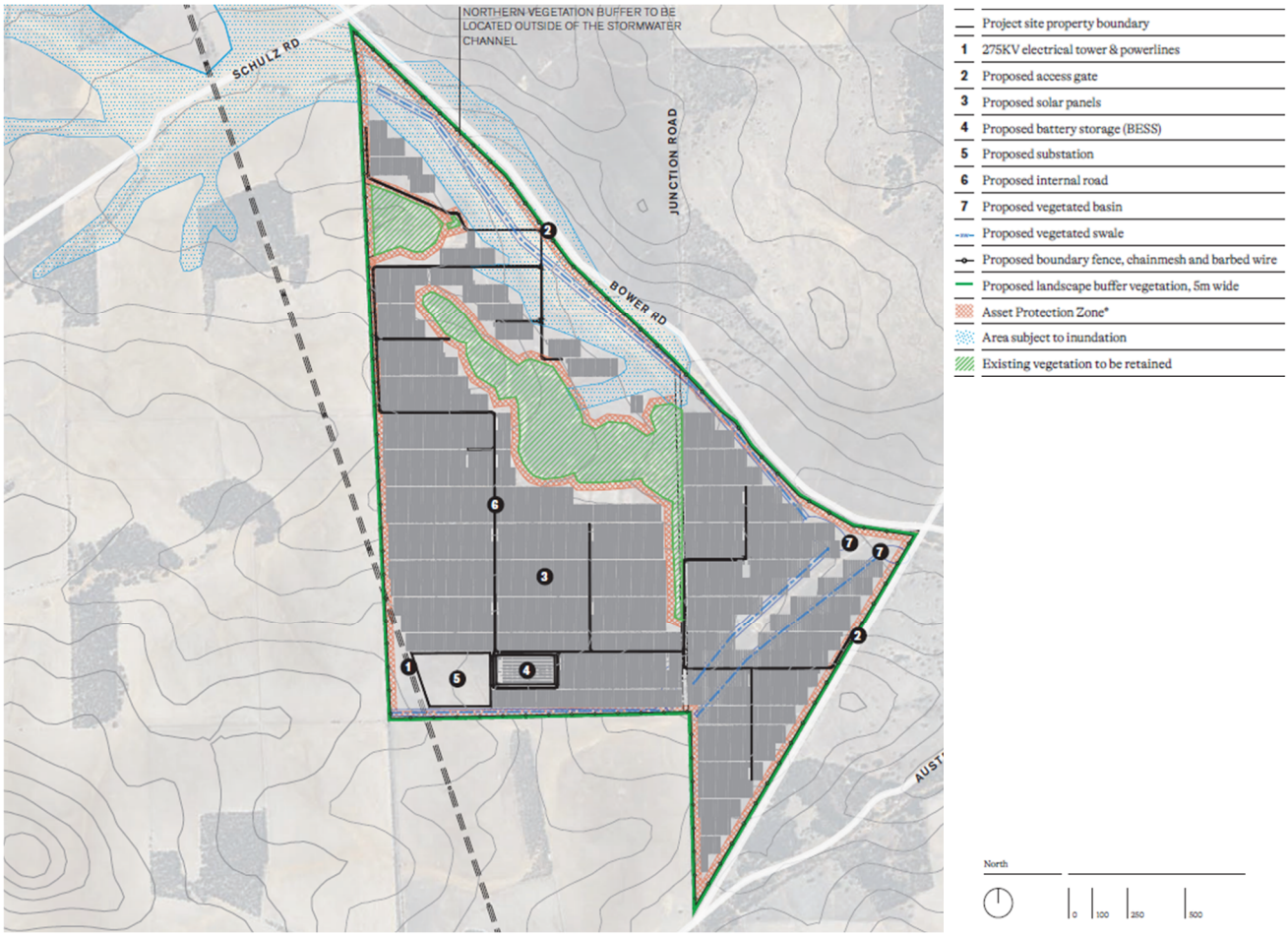


Figure 18: Landscaping Approach and Strategy (Source: Landskap)

10.4 Stormwater, Water Quality and Flooding

The subject land is located within the Water Resources and Hazards (Flooding – Evidence Required) Overlays. Respectively, these overlays seek to protect surface water quality and take a precautionary approach to mitigate potential impacts of flood risk.

A Stormwater Management Strategy prepared by Wallbridge Gilbert Aztec (WGA) identifies several water flow paths within the site including a main drainage channel along the northern boundary (Figure 19).

The ground mounted solar arrays will not impede the natural flow of water across the site nor change the topography.

Stormwater and flood management measures consist of locating solar arrays at least 10 metres outside of the natural flow paths of watercourses. Vegetated drainage swales are proposed to be installed in natural flow paths to capture and direct runoff to onsite retention basins, as shown in Figure 20, preventing downstream flooding, erosion and nuisance.

Figure 19: Drainage channel along northern boundary

To ensure flood risk and surface water quality impacts associated with the proposal are appropriately managed, it is recommended that the applicant prepare a final stormwater management plan as part of detailed design. This can be appropriately managed through a condition of approval.

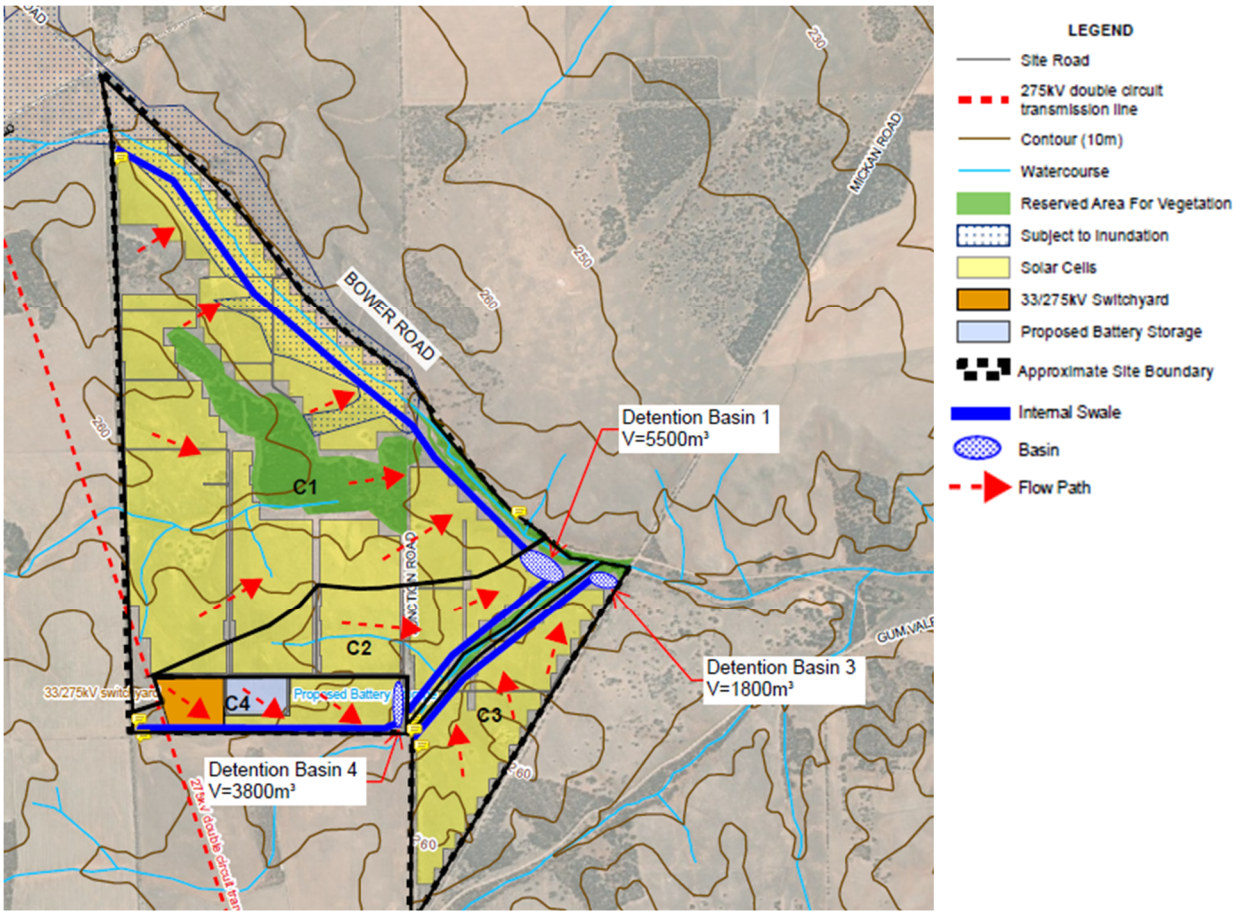


Figure 20: Stormwater Strategy

10.5 Hazards – Bushfire, Fire and Overhead Powerlines

Hazard management for renewable energy generation facilities centres on risks associated with fire, bushfire and clearance from overhead powerlines, noting that flood management is discussed above.

Relevant Code policies are set out in the Hazards (Bushfire – Regional) Overlay, Clearance from Overhead Powerlines and Infrastructure and Renewable Energy Facilities modules.

These policies require consideration be given to clearances around infrastructure, provision of fire access tracks and water tanks, and management of works around powerlines. The application was referred to the CFS who confirmed these requirements.

The application notes that the facility has been sited and designed to meet CFS requirements and clearance from powerlines. The design includes Asset Protection Zones and siting of the substation and BESS as far as practical from dwellings; access and internal roads designed for emergency vehicles and to serve as fire breaks; dedicated water supply for fire-fighting and a vegetation management strategy. Bushfire and Emergency Management Plans will be developed and maintained by the operator.

Based on the above, the proposal satisfies the relevant Code provisions.

10.6 Interface between Land Uses

The Code identifies the need to consider setbacks from other uses (Infrastructure and Renewable Energy PO 9.3, 9.4) and manage adverse impacts associated with noise, light spill, air quality and glare (Interface between Land Uses PO 4.2, 6.1-2, 7.1) both during construction and ongoing operations.

It is noted that representations were received from several nearby residents expressing concern regarding potential nuisance impacts associated with construction and operation of the facility, including from the occupants of the three dwellings located within two kilometres of the subject site. The closest dwelling is approximately 150 metres north of the northern boundary, the next closest approximately 700 metres south of the southern boundary, and the third is located 1.9 km to the south-west.

10.6.1 Setbacks

With respect to setbacks for solar facilities, DPF 9.3 (Renewable Energy module) recommends a separation of at least two (2) kilometres from a Township, Rural Settlement, Rural Neighbourhood and Rural Living Zones and a setback of at least 30 metres from adjoining land boundaries.

The proposed development would be situated at least 10 kilometres from the nearest township (Robertstown) in a rural locality dominated by broadacre farming with sparsely scattered dwellings and outbuildings. The design of the proposal includes an Asset Protection Zone buffer of at least 30 metres between the perimeter fence and project infrastructure, which will incorporate landscaping. The north of the site, closest to the nearest dwelling, will have an additional setback of up to 200 metres to accommodate an area subject to inundation.

Based on the rural setting and proposed setbacks, the proposed development satisfies PO 9.3 and 9.4 of the Code relating to separation of solar facilities from sensitive uses.

10.6.2 Noise, Light Spill and Air Quality

The applicant notes that there will be little noise associated with the operation and maintenance of the facility. External lighting will comply with the relevant Australian Standard and be directed towards the substation, which is located at least two kilometres from the nearest residence.

Noise impacts during construction is anticipated due to movement of heavy vehicles and machinery and earthworks. The applicant intends to provide a Construction Environmental Management Plan (CEMP) prior to construction to ensure appropriate management measures are undertaken in accordance with Environment Protection Agency construction noise standards, including hours of operation. This can appropriately be reflected as a condition of approval.

With respect to air quality, with the proposed landscaping and maintenance of groundcover and drainage swales the facility is not expected to generate dust beyond that experienced in the existing rural setting. Dust associated with project increases in traffic are discussed at 10.7.

10.6.3 Glint and Glare

Interface between Land Uses PO7.1 seeks to ensure that materials and finishes do not unreasonably impact to adjacent road users or land uses. The proposed solar array has the potential to cause a glint and/or glare impact beyond the subject land. A Glint and Glare Assessment undertaken by Environmental Ethos assessed the impact of the proposed development on users of adjacent roads and observation points within the area. Key findings:

- No potential glare hazard impacts affecting residential receivers within 3 kilometres of the facility
- No potential glare hazard affecting Bower Road, Back Road and Australia Plains / Emmaus Roads.
- Solar Array 5, which is located in the east of the project site, was identified as generating a small amount of glare affecting Mickan Road and a very small amount affecting Schulz Road when resting at 5 degrees. This could be mitigated by adjusting the resting angle to 6 degrees until proposed screen planting on the perimeter reaches maturity.
- It is recommended that the project Operational Environmental Management Plan (OEMP) detail glare management measures required to avoid impacts on sensitive receptors, including the recommended resting angle limits and a process for managing and rectifying complaints.

The proposed development is consistent with requirements of the Code. It is recommended that any approval include advice on addressing impacts on adjacent properties through CEMP and OEMPs.

10.7 Traffic Impact, Access and Parking

The Code provisions set out in the Transport, Access and Parking module seeks to ensure safe and efficient vehicle access to/from the subject site while minimising impacts on the performance of the road network (PO1.1, 1.4) and impacts on sensitive receivers (PO1.2).

Several respondents raised concerns about impact of heavy vehicles on the condition and safety of the unsealed road network, as well as amenity impacts due to dust and noise.

Increased traffic activity will occur during the 18-24 month construction period, with forecast daily traffic volumes of 19 commercial vehicle and 30 light vehicles movements. Once operational, traffic volumes will be limited to routine inspections and maintenance as the site will be remotely monitored and operated. The applicant indicates that the access points and internal roads will be designed to accommodate the type and volume of traffic anticipated, including emergency vehicles as required by the CFS.

A Traffic Impact Assessment undertaken by CIRQA recommends two potential haulage route options for use during construction via Emmaus Road / Australia Plains Road (Route 2) or Schulz Road (Route 3). Both options involve access from Worlds End Highway (State Maintained Road) and will require upgrades to both state and local roads at the cost of the applicant. Both proposed routes also pass several dwellings located directly adjacent the roadside. It is recommended that the criteria for selecting the preferred haulage route include minimising the number of dwellings located adjacent the route.

The application was referred to the Commissioner of Highways (CoH) for technical advice due to the proposed access from a State Maintained Road. The CoH supports the development and recommends five (5) conditions including with respect to selection of a preferred haulage route and preparation of a traffic management plan (TMP). The TMP should include details of proposed upgrades as well as measures to mitigate traffic impacts and meet road safety and design standards.

Council does not object to the proposal and provided no comments regarding traffic impacts and access.

Subject to the recommended conditions of approval proposed by the CoH and with respect to consideration of local residents in selection of the preferred haulage route, the proposal is considered acceptable in terms of the safe and efficient management of traffic and access.

11. CONCLUSION

The development of a 200MW solar facility and associated infrastructure is consistent with the provisions of the Rural Zone, which supports establishment of renewable energy facilities where they minimise significant fragmentation and displacement of existing primary production and are located in proximity to the existing electricity transmission network.

During the public notification period, sixteen representations were received opposing the development. Key areas of concern were impacts on flora and fauna, loss of productive land, increased fire and flood risk, and loss of amenity. These concerns, along with the requirements of the Code, were considered in the assessment.

The proposed development will not have an adverse impact on the continuation of primary production activities in the immediate vicinity of the facility. In addition, the siting and design of the panels will allow the subject site to continue to be used for sheep grazing.

With respect to flora and fauna, the investigations undertaken determined that the proposed clearance of native vegetation is 'low level', with the impact footprint designed to avoid large areas of significant habitats both within and bordering the site. Proposed revegetation with local species will contribute to habitat regeneration and provide a physical and visual buffer from neighbouring uses over time.

The siting and design of the development also incorporates flood and fire risk mitigation measures, including by avoiding natural water courses, establishing asset protection zones, and providing access for emergency vehicles. The preliminary stormwater management plan proposes onsite management and retention of water to avoid downstream flooding and water quality impacts. Ensuring these measures are reflected in final designs can be effectively managed through conditions of approval, including preparation of a final Stormwater Management Plan.

Consideration of impacts on local amenity included a Visual Impact Assessment and Glint and Glare Assessment. These studies provided evidence that while the proposal does represent a significant change to the appearance of the subject site, the local topography, existing vegetation, proposed setbacks and perimeter landscaping are expected to limit the potential visual and glare impacts to an acceptable level for nearby dwellings and public roads.

Ongoing noise, light spill and dust impacts are not anticipated once the facility is operational. However, during the 18-24 month construction phase there will be noise impacts associated with heavy vehicles, machinery and earthworks. It is recommended that provision of a Construction Environmental Management Plan be a condition attached to of any approval granted to ensure appropriate management measures are taken, including with respect to hours of operation in accordance Environment Protection Agency construction noise standards.

A relatively high volume of both heavy and light vehicles will be generated during the construction phase, which will require considered management of impacts on other road users and residents along the proposed haulage route. The applicant has noted that a Traffic Management Plan will need to be developed in consultation with council and the Department for Infrastructure and Transport setting out measures to minimise impacts and ensure necessary road upgrades are undertaken to maintain the performance and safety of the road network.

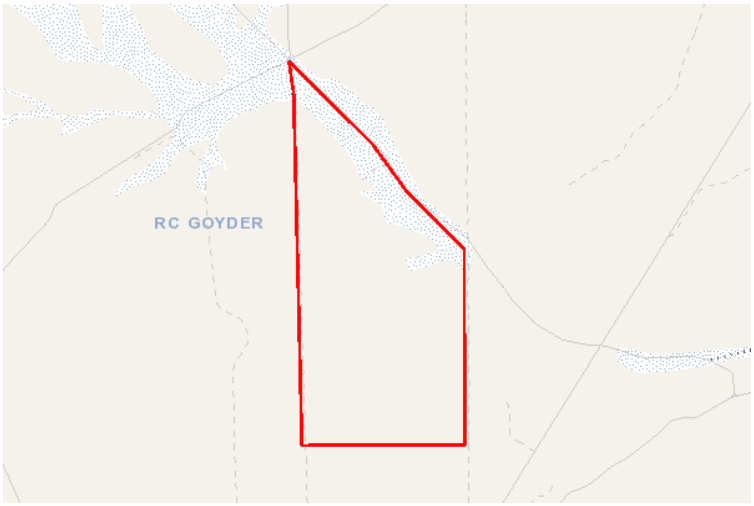
Pursuant to Section 131 of the *Planning, Development and Infrastructure Act 2016,* and having undertaken an assessment of the application against the relevant provisions of the Planning and Design Code and State Planning Policies, the application is generally in accordance with its provisions for the reasons outlined in this report.

APPENDIX 1B - RELEVANT PLANNING AND DESIGN CODE POLICIES

Planning and Design Code (Version 2024.5: 14 March 2024)		
Zone		
Rural Zone	DO1, DO2	*Land Use and Intensity - PO1.1* *Siting and Design - PO2.1* *Renewable Energy Facilities - PO9.1*
Overlays		
Hazards (Bushfire – Regional)	DO1, DO2	*Siting - PO1.1* *Built Form - PO2.1* *Vehicle Access-Roads /Driveways - PO5.1, PO5.3*
Hazards (Flooding – Evidence Required)	DO1	*Flood Resilience - PO2.1* *Environmental Protection - PO2.1*
Native Vegetation	DO1	*Environmental Protection - PO1.1, PO1.2, PO1.4*
Water Resources	DO1, DO2	*PO1.1, PO1.5, PO1.7, PO1.8*
General Development Policies		
Clearance from Overhead Powerlines	DO1	*PO1.1*
Design	DO1	*Landscaping - PO3.1, PO3.2* *Water Sensitive Design - PO5.1*
Infrastructure and Renewable Energy Facilities	DO1	*General - PO1.1* *Visual Amenity - PO2.1, PO2.2, PO2.3* *Hazard Management - PO4.2, PO4.3* *Electricity Infrastructure & Battery Storage - PO5.1, PO5.3* *Renewable Energy Facilities - PO7.1* *Renewable Energy Facilities (Solar Power) - PO9.1, PO9.2, PO9.3, PO9.4* *Temporary Facilities - PO13.1, PO13.2*
Interface between Land Uses	DO1	*General Land Use Compatibility - PO1.2* *Hours of Operation - PO2.1* *Noise and Vibration - PO4.1, PO4.2* *Light Spill - PO6.1* *Solar Reflectivity / Glare - PO7.1* *Electrical Interference - PO8.1*
Transport, Access and Parking	DO1	*Movement Systems - PO1.1, PO1.2, PO1.4* *Sightlines - PO2.1* *Vehicle Access - PO3.1, PO3.3, PO3.4, PO3.8, PO3.9* *Vehicle Parking Rates - PO5.1* *Vehicle Parking Areas - PO6.2, PO6.6*

Address: LOT 315 BOWER RD AUSTRALIA PLAINS SA 5374

To view a detailed interactive property map in SAPPA click on the map below



Property Zoning Details

Zone

Rural

Overlay

Hazards (Bushfire - Regional)
Hazards (Flooding - Evidence Required)
Murray-Darling Basin
Native Vegetation
Water Resources

Local Variation (TNV)

Minimum Site Area *(Minimum site area is 100 ha)*

Development Pathways

- Rural

1. Accepted Development
   Means that the development type does not require planning consent (planning approval). Please ensure compliance with relevant land use and development controls in the Code.

   - Agricultural building
   - Air handling unit, air conditioning system or exhaust fan
   - Brush fence
   - Building alterations
   - Building work on railway land
   - Carport
   - Farming
   - Outbuilding
   - Partial demolition of a building or structure
   - Private bushfire shelter
   - Protective tree netting structure
   - Shade sail
   - Solar photovoltaic panels (ground mounted)
   - Solar photovoltaic panels (roof mounted)
   - Swimming pool or spa pool and associated swimming pool safety features
   - Verandah
   - Water tank (above ground)

- Water tank (underground)

2. Code Assessed - Deemed to Satisfy
   Means that the development type requires consent (planning approval). Please ensure compliance with relevant land use and development controls in the Code.

   - Advertisement
   - Agricultural building
   - Carport
   - Deck
   - Outbuilding
   - Replacement building
   - Shop
   - Temporary accommodation in an area affected by bushfire
   - Verandah

3. Code Assessed - Performance Assessed
   Performance Assessed development types listed below are those for which the Code identifies relevant policies.
   Additional development types that are not listed as Accepted, Deemed to Satisfy or Restricted default to a Performance assessed Pathway. Please contact your local council for more information.

   - Advertisement
   - Agricultural building
   - Ancillary accommodation
   - Brewery
   - Carport
   - Cidery
   - Deck
   - Demolition
   - Detached dwelling
   - Distillery
   - Dwelling addition
   - Fence
   - Horticulture
   - Industry
   - Land division
   - Outbuilding
   - Retaining wall
   - Shop
   - Store
   - Tourist accommodation
   - Tree-damaging activity
   - Verandah
   - Warehouse
   - Winery
   - Workers' accommodation

4. Impact Assessed - Restricted
   Means that the development type requires approval. Classes of development that are classified as Restricted are listed in Table 4 of the relevant Zones.

Part 2 - Zones and Sub Zones

Rural Zone

Assessment Provisions (AP)

Desired Outcome (DO)

Desired Outcome	
DO 1	A zone supporting the economic prosperity of South Australia primarily through the production, processing, storage and distribution of primary produce, forestry and the generation of energy from renewable sources.
DO 2	A zone supporting diversification of existing businesses that promote value-adding such as industry, storage and warehousing activities, the sale and consumption of primary produce, tourist development and accommodation.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
Land Use and Intensity	
PO 1.1 The productive value of rural land for a range of primary production activities and associated value adding, processing, warehousing and distribution is supported, protected and maintained.	DTS/DPF 1.1 Development comprises one or more of the following: (a) Advertisement (b) Agricultural building (c) Brewery (d) Carport (e) Cidery (f) Commercial forestry (g) Dairy (h) Dam (i) Distillery (j) Dwelling (k) Dwelling addition (l) Farming (m) Horse keeping (n) Horticulture (o) Industry (p) Intensive animal husbandry (q) Low intensity animal husbandry (r) Outbuilding (s) Renewable energy facility (t) Shop (u) Small-scale ground mounted solar power facility (v) Stock slaughter works (w) Tourist accommodation (x) Transport distribution (y) Verandah (z) Warehouse (aa) Winery (ab) Workers' accommodation
Siting and Design	
PO 2.1 Development is provided with suitable vehicle access.	DTS/DPF 2.1 Development is serviced by an all-weather trafficable public road.
PO 2.2 Buildings are generally located on flat land to minimise cut and fill and the associated visual impacts.	DTS/DPF 2.2 Buildings: (a) are located on sites with a slope not greater than 10% (1-in-10)

	(b) do not result in excavation and/or filling of land greater than 1.5m from natural ground level.
Horticulture	
PO 3.1 Horticulture is located and conducted on land that has the physical capability of supporting the activity and in a sustainable manner that: (a) enhances the productivity of the land for the growing of food and produce in a sustainable manner (b) avoids adverse interface conflicts with other land uses (c) utilises sound environmental practices to mitigate negative impacts on natural resources and water quality (d) is sympathetic to surrounding rural landscape character and amenity where horticulture is proposed to be carried out in enclosed buildings such as such as greenhouses.	DTS/DPF 3.1 Horticultural activities: (a) are conducted on an allotment with an area of at least 1ha (b) are sited on land with a slope not greater than 10% (1-in-10) (c) are not conducted within 50m of a watercourse or native vegetation (d) are not conducted within 100m of a sensitive receiver in other ownership (e) provide for a headland area between plantings and property boundaries of at least 10m in width (f) where carried out in an enclosed building such as a greenhouse, the building has a total floor area not greater than 250m^2 (g) where in the form of olive growing are not located within 500m of a conservation or national park.
Rural Industry	
PO 4.1 Small-scale industry (including beverage production and washing, processing, bottling and packaging activities), storage, warehousing, produce grading and packing, transport distribution or similar activities provide opportunities for diversification and value adding to locally sourced primary production activities.	DTS/DPF 4.1 Industries, storage, warehousing, produce grading and packing and transport distribution activities and similar activities (or any combination thereof): (a) are directly related and ancillary to a primary production use on the same or adjoining allotment (b) are located on an allotment not less than 20ha in area (c) have a total floor area not exceeding 500m^2.
PO 4.2 Expansion of established small-scale or new large scale industry (including beverage production and washing, processing, bottling and packaging activities), storage, warehousing, produce grading and packing, transport distribution or similar activities: (a) are commensurate with the allotment on which it is situated to mitigate adverse impacts on the amenity of land in other ownership and the character of the locality (b) realise efficiencies in primary production related storage, sorting, packaging, manufacturing and the like (c) primarily involve primary production commodities sourced from the same allotment and /or surrounding rural areas.	DTS/DPF 4.2 None are applicable.
PO 4.3 Industry, storage, warehousing, transport distribution or similar activities are sited, designed and of a scale that maintains rural character and function and respects landscape amenity.	DTS/DPF 4.3 Buildings and associated activities: (a) are set back at least 100m from all road and allotment boundaries (b) are not sited within 200m of a sensitive receiver in other ownership (c) have a building height not greater than 10m above natural ground level (d) incorporate the loading and unloading of vehicles within the confines of the allotment.
Dwellings	
PO 5.1 Dwellings provide a convenient base for landowners to conduct and manage commercial scale primary production and rural related value adding activities without compromising the use of the allotment,	DTS/DPF 5.1 Dwellings: (a) are located on an allotment with an area not less than:

adjacent land or long term purpose of the zone for primary production or related tourism values due to a proliferation of dwellings.	(b) are located on an allotment used for and is ancillary to primary production and/or primary production related value-adding activities (c) will not result in more than one dwelling on an allotment. In relation to DTS/DPF 5.1, in instances where: (d) more than one value is returned in the same field, refer to the *Minimum Dwelling Allotment Size Technical and Numeric Variation layer* in the SA planning database to determine the applicable value relevant to the site of the proposed development (e) no value is returned for DTS/DPF 5.1(a) (ie there is a blank field), then there is no minimum dwelling allotment size applicable and DTS/DPF 5.1(a) is met.
PO 5.2 Development resulting in more than one dwelling on an allotment supports ageing in place for the owner of the allotment or multi-generational management of farms in a manner that minimises the potential loss of land available for primary production.	DTS/DPF 5.2 Dwelling that will result in more than one dwelling on an allotment where all the following are satisfied: (a) it is located within 20m of an existing dwelling (b) shares the same utilities of the existing dwelling (c) will use the same access point from a public road as the existing dwelling (d) it is located on an allotment not less than 40ha in area (e) will not result in more than two dwellings on the allotment.
PO 5.3 Dwelling are sited, designed and of a scale that maintains a pleasant rural character and amenity.	DTS/DPF 5.3 Dwellings: (a) are set back from all allotment boundaries by at least 40m (b) do not exceed 2 building levels and 9m measured from the top of the footings (c) have a wall height that is no greater than 6m.
PO 5.4 Dwelling additions are sited, designed and of a scale that maintains a pleasant rural character and amenity.	DTS/DPF 5.4 Additions or alterations to an existing dwelling: (a) are set back from all allotment boundaries by at least 40m (b) do not exceed 2 building levels and 9m measured from the top of the footings (c) have a wall height that is no greater than 6m.
Shops, Tourism and Function Venues	
PO 6.1 Shops are associated with an existing primary production use or primary production related value adding industry to support diversification of employment, provide services to visitors and showcase local and regional products.	DTS/DPF 6.1 Shops: (a) are ancillary to and located on the same allotment or an adjoining allotment used for primary production or primary production related value adding industries (b) offer for sale or consumption produce or goods that are primarily sourced, produced or manufactured on the same allotment or adjoining allotments (c) have a gross leasable floor area not exceeding $100m^2$ or $250m^2$ in the case of a cellar door (d) have an area for the display of produce or goods external to a building not exceeding $25m^2$.
PO 6.2 Shops that are proposed in new buildings are sited, designed and of a scale that maintains a pleasant rural character and amenity.	DTS/DPF 6.2 Shops in new buildings: (a) are set back from all allotment boundaries by at least 40m (b) are not sited within 100m of a sensitive receiver in other ownership

	(c) have a building height that does not exceed 9m above natural ground level.
PO 6.3 Tourist accommodation is associated with the primary use of the land for primary production or primary production related value adding industry to enhance and provide authentic visitor experiences.	DTS/DPF 6.3 Tourist accommodation: (a) is ancillary to and located on the same allotment or an adjoining allotment used for primary production or primary production related value adding industry (b) in relation to the area used for accommodation: (i) where in a new building, or buildings, does not exceed a cumulative total floor area of 100m^2 or (ii) where in an existing building, does not exceed a total floor area of 150m^2 and (c) does not result in more than one tourist accommodation facility being located on the same allotment.
PO 6.4 Tourist accommodation proposed in a new building or buildings is sited, designed and of a scale that maintains a pleasant rural character and amenity.	DTS/DPF 6.4 Tourist accommodation in new buildings: (a) is set back from all allotment boundaries by at least 40m (b) has a building height that does not exceed 7m above natural ground level.
PO 6.5 Function venues are associated with the primary use of the land for primary production or primary production related value adding industry.	DTS/DPF 6.5 Function venues: (a) are ancillary to and located on the same allotment or an adjoining allotment used for primary production or primary production related value adding industry (b) do not result in more than 75 persons for customer dining purposes.
PO 6.6 Function venues are sited, designed and of a scale that maintains a pleasant natural and rural character and amenity.	DTS/DPF 6.6 Function venues: (a) are located on an allotment having an area of at least 5ha (b) are set back from all property boundaries by at least 40m (c) are not sited within 100m of a sensitive receiver in other ownership (d) have a building height that does not exceed 9m above natural ground level.
Offices	
PO 7.1 Offices are directly related to and associated with the primary use of the land for primary production or primary production related value adding industry.	DTS/DPF 7.1 Offices: (a) are ancillary to and located on the same allotment or an adjoining allotment used for primary production or primary production related value adding industry (b) have a gross leasable floor area not exceeding 100m^2.
Adaptive Reuse of Existing Buildings	
PO 8.1 Adaptive reuse of existing buildings for small-scale shops, offices, tourist accommodation or ancillary rural activities.	DTS/DPF 8.1 Development within an existing building is for any of the following: (a) a shop (b) office (c) tourist accommodation.
Renewable Energy Facilities	

PO 9.1 Renewable energy facilities and ancillary development minimises significant fragmentation or displacement of existing primary production.	DTS/DPF 9.1 None are applicable.
PO 9.2 Small-scale, ground-mounted solar power facilities support rural production or value-adding industries.	DTS/DPF 9.2 None are applicable.
Built Form and Character	
PO 10.1 Large buildings are designed and sited to reduce impacts on scenic and rural vistas by: (a) having substantial setbacks from boundaries and adjacent public roads (b) using low-reflective materials and finishes that blend with the surrounding landscape (c) being located below ridgelines.	DTS/DPF 10.1 None are applicable.
Land Division	
PO 11.1 Land division, including boundary realignments, promotes productive, efficient and sustainable primary production.	DTS/DPF 11.1 Allotments have an area not less than: **Minimum Site Area** Minimum site area is 100 ha In relation to DTS/DPF 11.1, in instances where: (a) more than one value is returned in the same field, refer to the *Minimum Site Area Technical and Numeric Variation* layer in the SA planning database to determine the applicable value relevant to the site of the proposed development (b) no value is returned (i.e. there is a blank field), then none are applicable and the relevant development cannot be classified as deemed-to-satisfy.
PO 11.2 Land division, including boundary realignments, which facilitates the more intensive use of the land should occur only where: (a) the allotments are of a size and configuration to support the existing and proposed land uses (b) water of sufficient quality and quantity is available to sustain the proposed use (c) the use will be compatible with adjacent or nearby uses of land.	DTS/DPF 11.2 None are applicable.
PO 11.3 Allotment boundaries, including by realignment, are positioned to incorporate sufficient space around existing residential, tourist accommodation and other habitable buildings (including boarding houses, hostels, dormitory style accommodation, student accommodation and workers' accommodation) to: (a) maintain a pleasant rural character and amenity for occupants (b) manage vegetation within the same allotment to mitigate bushfire hazard.	DTS/DPF 11.3 Allotment boundaries are located no closer to an existing residential, tourist accommodation or other habitable building than the greater of the following: (a) 40m (b) the distance required to accommodate an asset protection zone wholly within the relevant allotment.
Agricultural Buildings	
PO 12.1 Agricultural buildings and associated activities are sited, designed and of a scale that maintains a pleasant rural character and function.	DTS/DPF 12.1 Agricultural buildings: (a) are located on an allotment having an area of at least 10ha (b) are set back at least 50m from an allotment boundary

	(c) have a building height not exceeding 10m above natural ground level (d) do not exceed 500m^2 in total floor area (e) incorporate the loading and unloading of vehicles within the confines of the allotment.
Outbuildings, Carports and Verandahs	
PO 13.1 Outbuildings are sited, designed and of a scale that maintains a pleasant rural character and amenity.	DTS/DPF 13.1 Outbuildings: (a) have a primary street setback that is at least as far back as the building to which it is ancillary (b) have a combined total floor area that does not exceed 150m^2 (c) do not exceed 5m in wall height measured from natural ground level (not including a gable end) (d) have a total roof height that does not exceed 6m measured from natural ground level (e) if clad in sheet metal, it is pre-colour treated or painted in a non-reflective colour (f) will not result in more than 2 outbuildings on the same allotment .
PO 13.2 Carports and verandahs are sited, designed and of a scale to maintain a pleasant rural character and amenity.	DTS/DPF 13.2 Carports and verandahs: (a) are set back from the primary street at least as far back as the building to which it is ancillary (b) have a total floor area that does not exceed 80m^2 (c) have a post height that does not exceed 3m measured from natural ground level (not including a gable end) (d) have a total roof height that does not exceed 5m measured from natural ground level (e) if clad in sheet metal, it is pre-colour treated or painted in a non-reflective colour.
Concept Plans	
PO 14.1 Development is compatible with the outcomes sought by any relevant Concept Plan contained within Part 12 - Concept Plans of the Planning and Design Code to support the orderly development of land through staging of development and provision of infrastructure.	DTS/DPF 14.1 The site of the development is wholly located outside any relevant Concept Plan boundary. The following Concept Plans are relevant: In relation to DTS/DPF 14.1, in instances where: (a) one or more Concept Plan is returned, refer to Part 12 - Concept Plans in the Planning and Design Code to determine if a Concept Plan is relevant to the site of the proposed development. Note: multiple concept plans may be relevant. (b) in instances where 'no value' is returned, there is no relevant concept plan and DTS/DPF 14.1 is met.
Advertisements	
PO 15.1 Freestanding advertisements that identify the associated business without creating a visually dominant element within the locality.	DTS/DPF 15.1 Freestanding advertisements: (a) do not exceed 2m in height (b) do not have a sign face that exceeds 2m^2 per side.

Table 5 - Procedural Matters (PM) - Notification

The following table identifies, pursuant to section 107(6) of the *Planning, Development and Infrastructure Act 2016*, classes of performance assessed development that are excluded from notification. The table also identifies any exemptions to the placement of notices when notification is required.

Interpretation

Notification tables exclude the classes of development listed in Column A from notification provided that they do not fall within a corresponding exclusion prescribed in Column B.

Where a development or an element of a development falls within more than one class of development listed in Column A, it will be excluded from notification if it is excluded (in its entirety) under any of those classes of development. It need not be excluded under all applicable classes of development.

Where a development involves multiple performance assessed elements, all performance assessed elements will require notification (regardless of whether one or more elements are excluded in the applicable notification table) unless every performance assessed element of the application is excluded in the applicable notification table, in which case the application will not require notification.

A relevant authority may determine that a variation to 1 or more corresponding exclusions prescribed in Column B is minor in nature and does not require notification.

Class of Development (Column A)	Exceptions (Column B)
1. Development which, in the opinion of the relevant authority, is of a minor nature only and will not unreasonably impact on the owners or occupiers of land in the locality of the site of the development.	None specified.
2. Any development involving any of the following (or of any combination of any of the following): (a) advertisement (b) agricultural building (c) air handling unit, air conditioning system or exhaust fan (d) ancillary accommodation (e) carport (f) deck (g) dwelling (h) dwelling addition (i) farming (j) fence (k) horse keeping (l) internal building works (m) land division (n) outbuilding (o) pergola (p) private bushfire shelter (q) protective tree netting structure (r) replacement building (s) retaining wall (t) shade sail (u) solar photovoltaic panels (roof mounted) (v) swimming pool or spa pool and associated swimming pool safety features (w) temporary accommodation in an area affected by bushfire (x) tree damaging activity (y) verandah (z) water tank.	None specified.
3. Any development involving any of the following (or of any combination of any of the following): (a) industry (b) store (c) warehouse.	Except development that exceeds the total floor area limit expressed in Rural Zone DTS/DPF 4.1(c) or does not satisfy Rural Zone DTS/DPF 4.3.

4. Demolition.	Except any of the following: 1. the demolition (or partial demolition) of a State or Local Heritage Place (other than an excluded building) 2. the demolition (or partial demolition) of a building in a Historic Area Overlay (other than an excluded building).
5. Function venue.	Except function venue that does not satisfy any of the following: 1. Rural Zone DTS/DPF 6.5(b) 2. Rural Zone DTS/DPF 6.6.
6. Horticulture.	Except horticulture that does not satisfy any of the following: 1. Rural Zone DTS/DPF 3.1(d) 2. Rural Zone DTS/DPF 3.1(e) 3. Rural Zone DTS/DPF 3.1(f).
7. Railway line.	Except where located outside of a rail corridor or rail reserve.
8. Shop.	Except shop that exceeds the gross leasable floor area limit expressed in Rural Zone DTS/DPF 6.1(c) or does not satisfy Rural Zone DTS/DPF 6.2.
9. Tourist accommodation.	Except tourist accommodation that does not satisfy any of the following: 1. Rural Zone DTS/DPF 6.3(b) 2. Rural Zone DTS/DPF 6.4.

Placement of Notices - Exemptions for Performance Assessed Development

Pursuant to regulation 47(6)(c) of the Planning, Development and Infrastructure (General) Regulations 2017, the requirement to place a notice on the relevant land under section 107(3)(a)(ii) of the *Planning, Development and Infrastructure Act 2016* does not apply in the Rural Zone.

Placement of Notices - Exemptions for Restricted Development

Pursuant to regulation 47(6)(c) of the Planning, Development and Infrastructure (General) Regulations 2017, the requirement to place a notice on the relevant land under section 110(2)(a)(iv) of *the Planning, Development and Infrastructure Act 2016* does not apply in the Rural Zone.

Part 3 - Overlays

Hazards (Bushfire - Regional) Overlay

Assessment Provisions (AP)

Desired Outcome (DO)

	Desired Outcome
DO 1	Development, including land division responds to the relevant level of bushfire risk and is sited and designed to mitigate the threat and impact of bushfires on life and property taking into account the increased frequency and intensity of bushfires as a result of climate change.
DO 2	To facilitate access for emergency service vehicles to aid the protection of lives and assets from bushfire danger.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
Siting	
PO 1.1 Buildings and structures are located away from areas that pose an unacceptable bushfire risk as a result of vegetation cover and type, and terrain.	DTS/DPF 1.1 None are applicable.
Built Form	
PO 2.1 Buildings and structures are designed and configured to reduce the impact of bushfire through using designs that reduce the potential for trapping burning debris against or underneath the building or structure, or between the ground and building floor level in the case of transportable buildings and buildings on stilts.	DTS/DPF 2.1 None are applicable.
PO 2.2 Extensions to buildings, outbuildings and other ancillary structures are sited and constructed using materials to minimise the threat of fire spread to residential and tourist accommodation (including boarding houses, hostels, dormitory style accommodation, student accommodation and workers', accommodation) in the event of bushfire.	DTS/DPF 2.2 Outbuildings and other ancillary structures are sited no closer than 6m from the habitable building.
Habitable Buildings	
PO 3.1 To minimise the threat, impact and exposure to bushfires on life and property, residential and tourist accommodation and habitable buildings for vulnerable communities (including boarding houses, hostels, dormitory style accommodation, student accommodation and workers' accommodation) is sited on the flatter portion of allotments away from steep slopes.	DTS/DPF 3.1 None are applicable.
PO 3.2 Residential and tourist accommodation and habitable buildings for vulnerable communities (including boarding houses, hostels, dormitory style accommodation, student accommodation and workers accommodation) is sited away from vegetated areas that pose an unacceptable bushfire risk.	DTS/DPF 3.2 Residential and tourist accommodation and habitable buildings for vulnerable communities are provided with asset protection zone(s) in accordance with (a) and (b): (a) the asset protection zone has a minimum width of at least: (i) 50 metres to unmanaged grasslands (ii) 100 metres to hazardous bushland vegetation (b) the asset protection zone is contained wholly within the allotment of the development.
PO 3.3 Residential and tourist accommodation and habitable buildings for vulnerable communities (including boarding houses, hostels, dormitory style accommodation, student accommodation and workers' accommodation) has a dedicated and accessible water supply available at all times for fire-fighting purposes.	DTS/DPF 3.3 Development has a dedicated water supply available at all times for fire-fighting purposes: (a) comprising a minimum of 5000 litres (b) positioned in an accessible location and accompanied with necessary equipment to allow occupants to minimise the spread of bushfire to the habitable building(s).
Land Division	
PO 4.1 Land division is designed to and incorporates measures to minimise the danger of fire hazard to residents and occupants of buildings, and to protect buildings and property from physical damage in the event of a bushfire.	DTS/DPF 4.1 None are applicable.

PO 4.2 Land division designed to provide a continuous street pattern to facilitate the safe movement and evacuation of emergency vehicles, residents, occupants and visitors.	DTS/DPF 4.2 None are applicable.
PO 4.3 Where 10 or more new allotments are proposed, land division includes at least two separate and safe exit points to enable multiple avenues of evacuation in the event of a bushfire.	DTS/DPF 4.3 None are applicable.
PO 4.4 Land division incorporates perimeter roads of adequate design in conjunction with bushfire buffer zones to achieve adequate separation between residential allotments and areas of unacceptable bushfire risk and to support safe access for the purposes of fire-fighting.	DTS/DPF 4.4 None are applicable.
Vehicle Access -Roads and Driveways	
PO 5.1 Roads are designed and constructed to facilitate the safe and effective: (a) access, operation and evacuation of fire-fighting vehicles and emergency personnel (b) evacuation of residents, occupants and visitors.	DTS/DPF 5.1 Roads: (a) are constructed with a formed, all-weather surface (b) have a gradient of not more than 16 degrees (1-in-3.5) at any point along the road (c) have a cross fall of not more than 6 degrees (1-in-9.5) at any point along the road (d) have a minimum formed road width of 6m (e) provide overhead clearance of not less than 4.0m between the road surface and overhanging branches or other obstructions including buildings and/or structures (Figure 1) (f) allow fire-fighting services (personnel and vehicles) to travel in a continuous forward movement around road curves by constructing the curves with a minimum external radius of 12.5m (Figure 2) (g) incorporating cul-de-sac endings or dead end roads do not exceed 200m in length and the end of the road has either: (i) a turning area with a minimum formed surface radius of 12.5m (Figure 3) or (ii) a 'T' or 'Y' shaped turning area with a minimum formed surface length of 11m and minimum internal radii of 9.5m (Figure 4) (h) incorporate solid, all-weather crossings over any watercourse that support fire-fighting vehicles with a gross vehicle mass (GVM) of 21 tonnes.
PO 5.2 Access to habitable buildings is designed and constructed to facilitate the safe and effective: (a) access, operation and evacuation of fire-fighting vehicles and emergency personnel (b) evacuation of residents, occupants and visitors.	DTS/DPF 5.2 Access is in accordance with (a) or (b): (a) a clear and unobstructed vehicle or pedestrian pathway of not greater than 60 metres in length is available between the most distant part of the habitable building and the nearest part of a formed public access road (b) driveways: (i) do not exceed 600m in length (ii) are constructed with a formed, all-weather surface (iii) are connected to a formed, all-weather public road with the transition area between the road and driveway having a gradient of not more than 7 degrees (1-in-8) (iv) have a gradient of not more than 16 degrees (1-in-3.5) at any point along the driveway (v) have a crossfall of not more than 6 degrees (1-in-9.5) at any point along the driveway

	(vi) have a minimum formed width of 3m (4m where the gradient of the driveway is steeper than 12 degrees (1-in-4.5)) plus 0.5 metres clearance either side of the driveway from overhanging branches or other obstructions, including buildings and/or structures (Figure 1) (vii) incorporate passing bays with a minimum width of 6m and length of 17m every 200m (Figure 5) (viii) provide overhead clearance of not less than 4.0m between the driveway surface and overhanging branches or other obstructions, including buildings and/or structures (Figure 1) (ix) allow fire-fighting services (personnel and vehicles) to travel in a continuous forward movement around driveway curves by constructing the curves with a minimum external radius of 12.5m (Figure 2) (x) allow fire-fighting vehicles to safely enter and exit an allotment in a forward direction by using a 'U' shaped drive through design or by incorporating at the end of the driveway either: A. a loop road around the building or B. a turning area with a minimum radius of 12.5m (Figure 3) or C. a 'T' or 'Y' shaped turning area with a minimum formed length of 11m and minimum internal radii of 9.5m (Figure 4) (xi) incorporate solid, all-weather crossings over any watercourse that support fire-fighting vehicles with a gross vehicle mass (GVM) of 21 tonnes.
PO 5.3 Development does not rely on fire tracks as means of evacuation or access for fire-fighting purposes unless there are no safe alternatives available.	DTS/DPF 5.3 None are applicable.

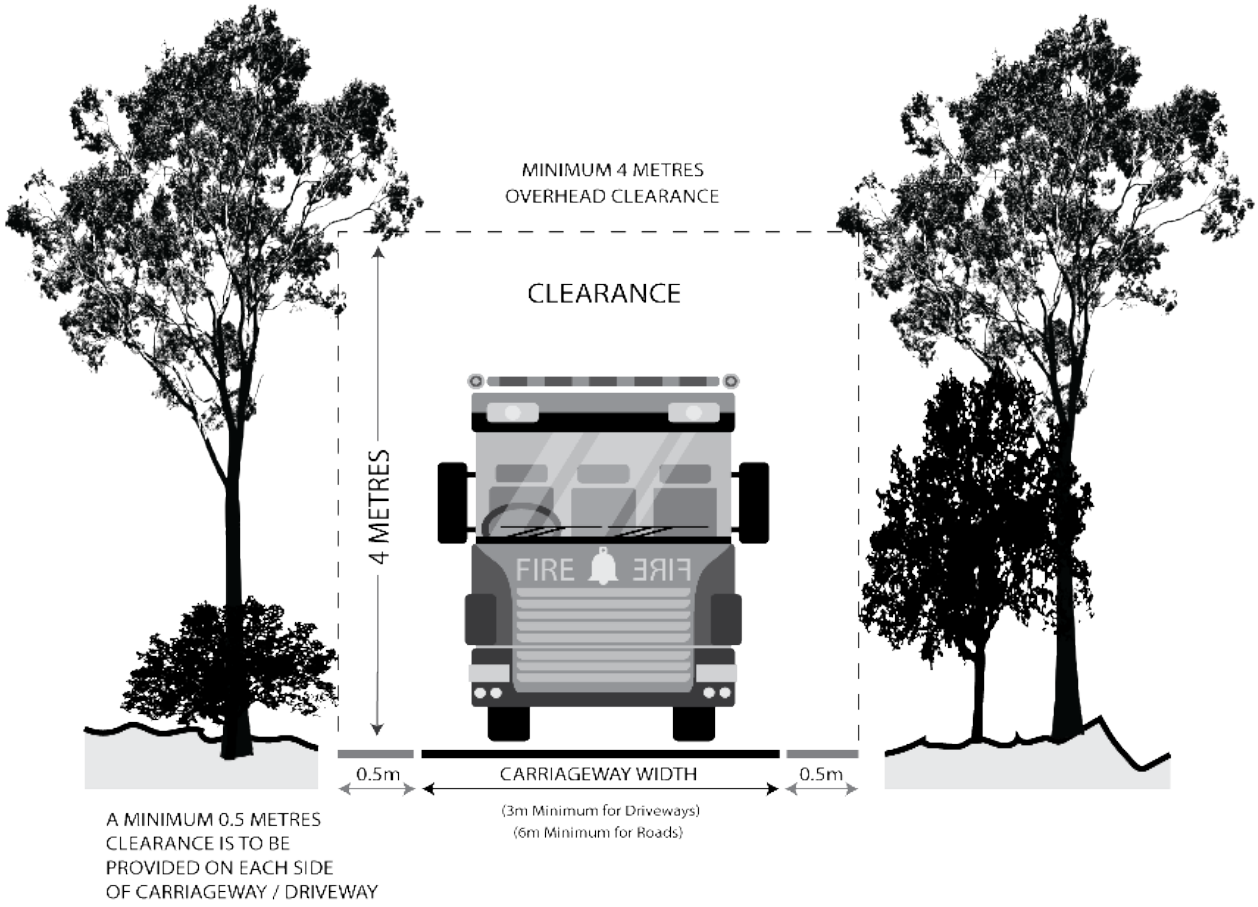
Procedural Matters (PM) - Referrals

The following table identifies classes of development / activities that require referral in this Overlay and the applicable referral body. It sets out the purpose of the referral as well as the relevant statutory reference from Schedule 9 of the Planning, Development and Infrastructure (General) Regulations 2017.

Class of Development / Activity	Referral Body	Purpose of Referral	Statutory Reference
None	None	None	None

Figures and Diagrams

Fire Appliance Clearances
Figure 1 - Overhead and Side Clearances



Roads and Driveway Design

Figure 2 - Road and Driveway Curves

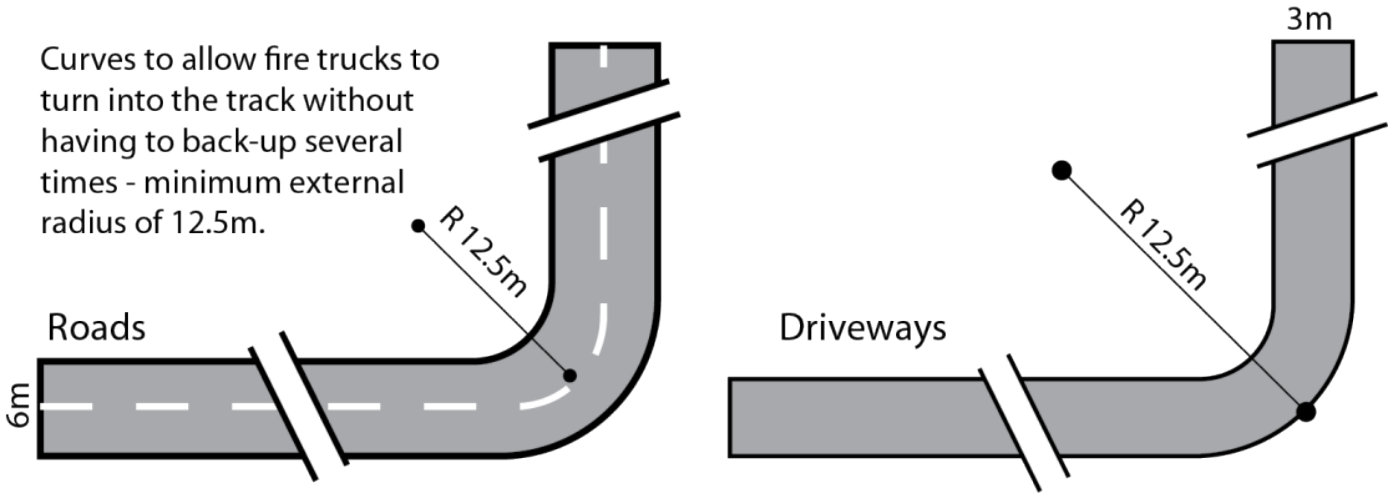


Figure 3 - Full Circle Turning Area

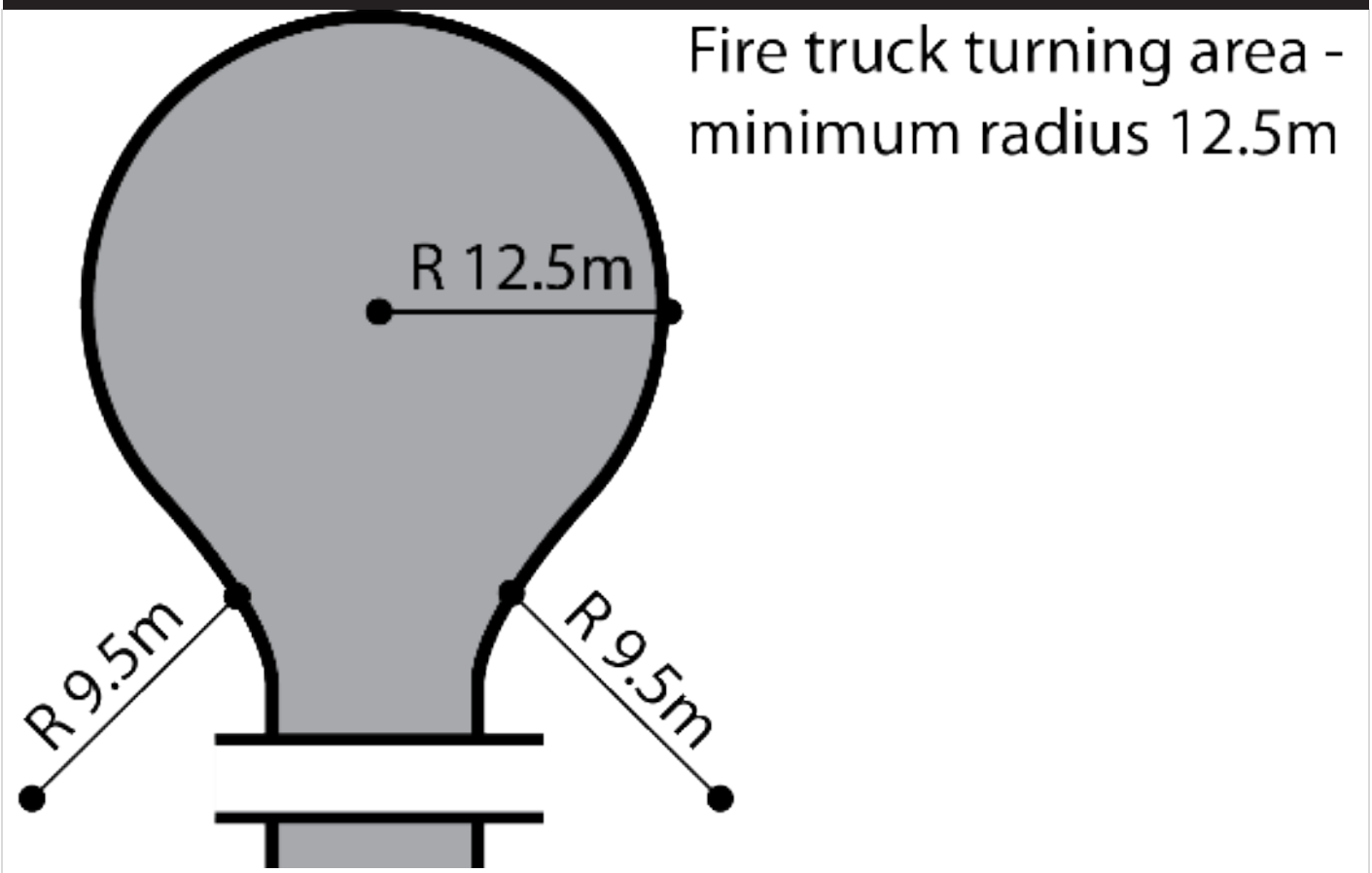
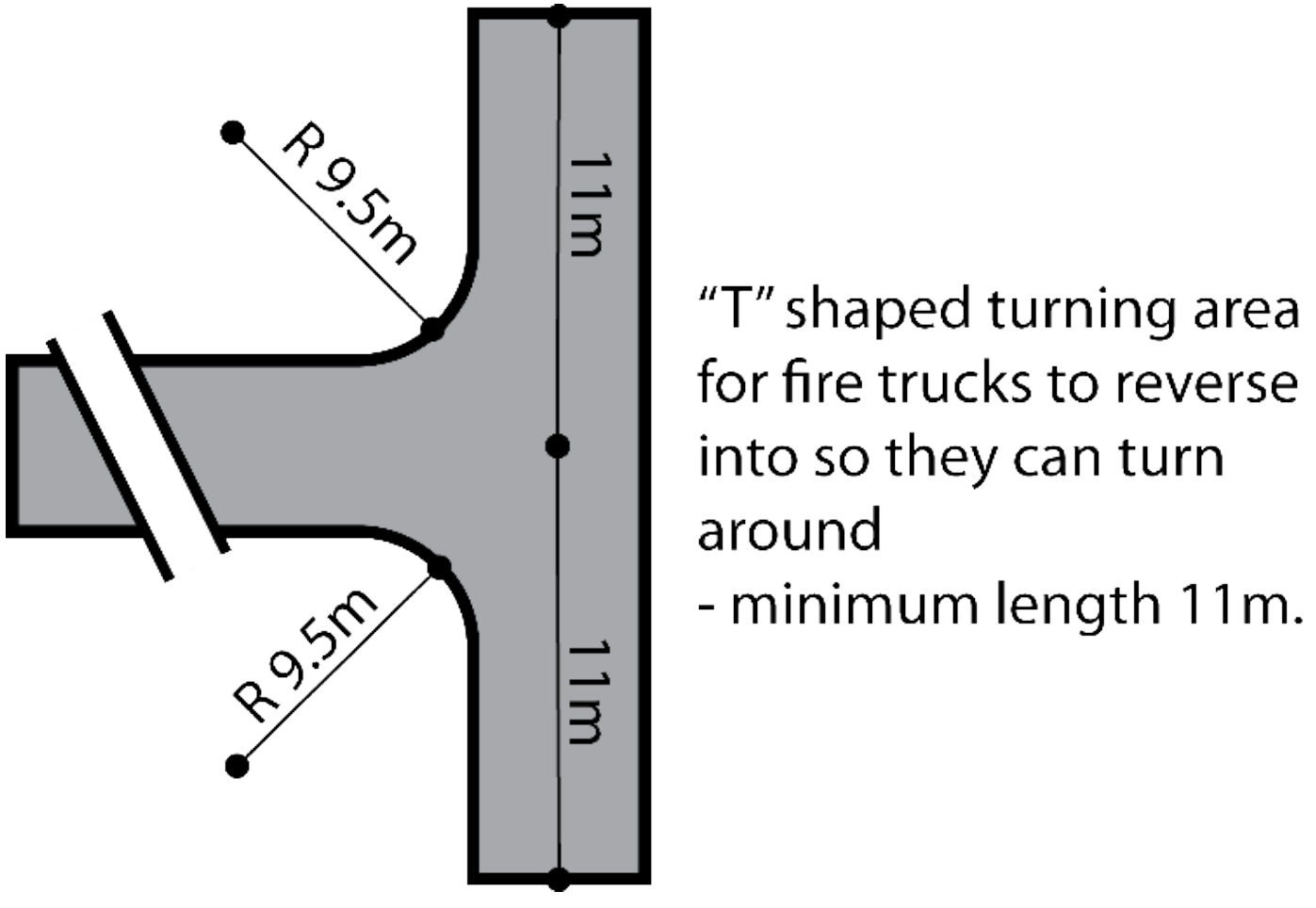


Figure 4 - 'T' or 'Y' Shaped Turning Head



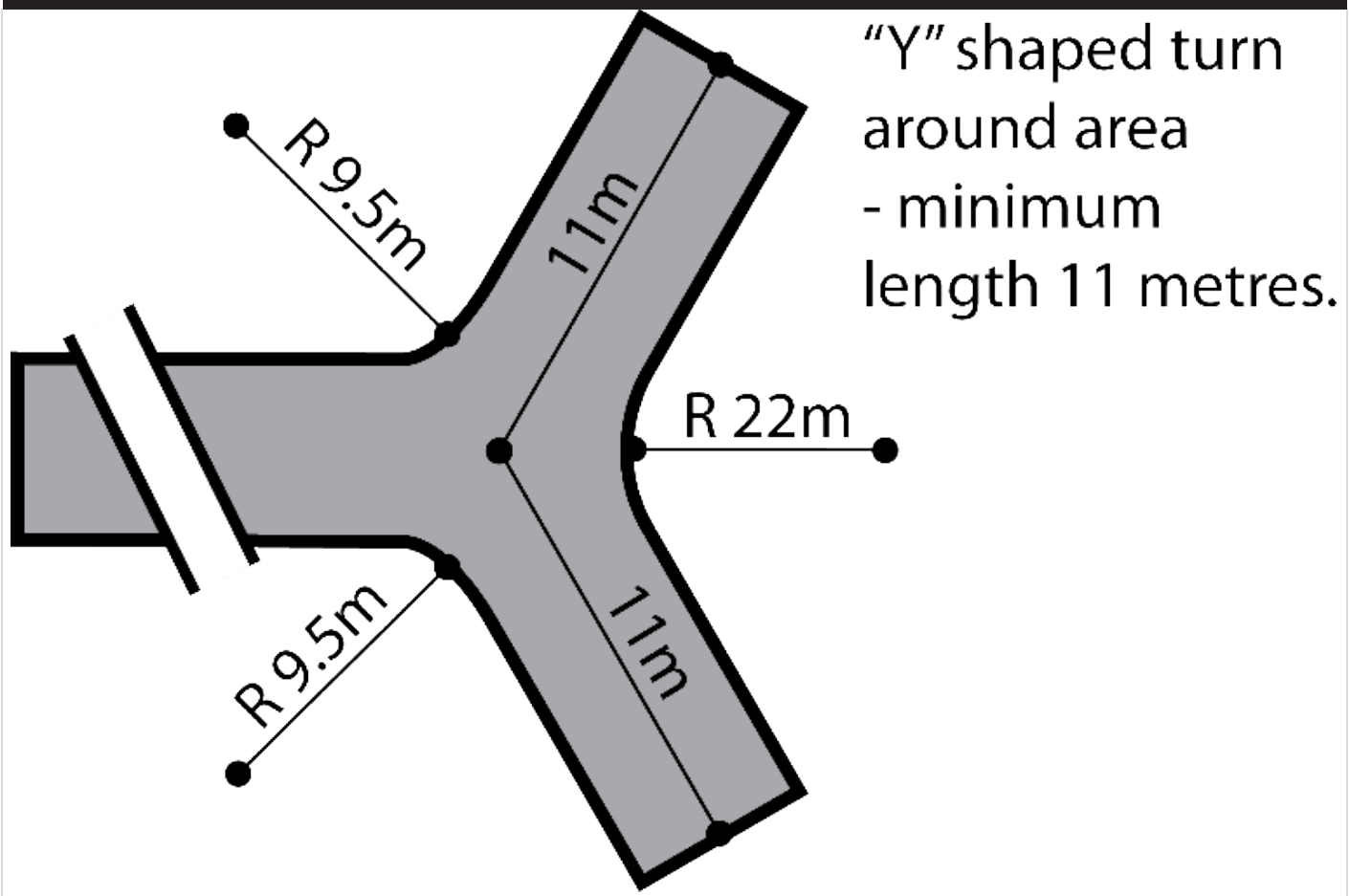
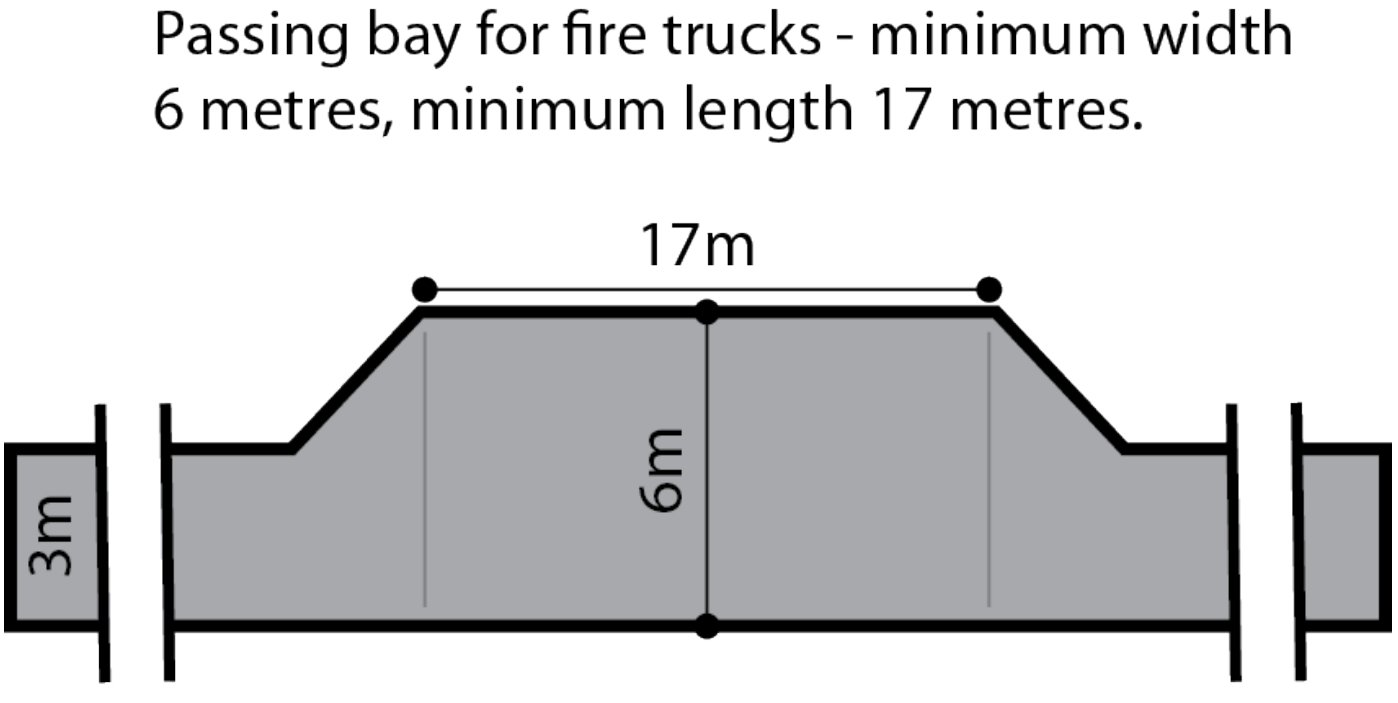


Figure 5 - Driveway Passing Bays



Hazards (Flooding - Evidence Required) Overlay

Assessment Provisions (AP)

Desired Outcome (DO)

Desired Outcome	
DO 1	Development adopts a precautionary approach to mitigate potential impacts on people, property, infrastructure and the environment from potential flood risk through the appropriate siting and design of development.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
Flood Resilience	
PO 1.1 Development is sited, designed and constructed to minimise the risk of entry of potential floodwaters where the entry of flood waters is likely to result in undue damage to or compromise ongoing activities within buildings.	DTS/DPF 1.1 Habitable buildings, commercial and industrial buildings, and buildings used for animal keeping incorporate a finished floor level at least 300mm above: (a) the highest point of top of kerb of the primary street or (b) the highest point of natural ground level at the primary street boundary where there is no kerb
Environmental Protection	
PO 2.1 Buildings and structures used either partly or wholly to contain or store hazardous materials are designed to prevent spills or leaks leaving the confines of the building.	DTS/DPF 2.1 Development does not involve the storage of hazardous materials.

Procedural Matters (PM) - Referrals

The following table identifies classes of development / activities that require referral in this Overlay and the applicable referral body. It sets out the purpose of the referral as well as the relevant statutory reference from Schedule 9 of the Planning, Development and Infrastructure (General) Regulations 2017.

Class of Development / Activity	Referral Body	Purpose of Referral	Statutory Reference
None	None	None	None

Murray-Darling Basin Overlay

Assessment Provisions (AP)

Desired Outcome (DO)

Desired Outcome	
DO 1	Sustainable water use in the Murray-Darling Basin area.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
PO 1.1 All development, but in particular development involving:	DTS/DPF 1.1 Development satisfies either of the following:

(a) horticulture (b) activities requiring irrigation (c) aquaculture (d) industry (e) intensive animal husbandry (f) horse keeping (g) commercial forestry has a lawful, sustainable and reliable water supply that does not place undue strain on water resources in the Murray-Darling Basin.	(a) the applicant has a current water licence in which sufficient spare capacity exists to accommodate the water needs of the proposed use or (b) the proposal does not involve the taking of water for which a licence would be required under the *Landscape South Australia Act 2019*.

Procedural Matters (PM) - Referrals

The following table identifies classes of development / activities that require referral in this Overlay and the applicable referral body. It sets out the purpose of the referral as well as the relevant statutory reference from Schedule 9 of the Planning, Development and Infrastructure (General) Regulations 2017.

Class of Development / Activity	Referral Body	Purpose of Referral	Statutory Reference
Any of the following classes of development that require, or may require water to be taken from the River Murray within the meaning of the *River Murray Act 2003* under a water licence required in addition to any allocation that has already been granted under the *Landscape South Australia Act 2019*: (a) horticulture (b) activities requiring irrigation (c) aquaculture (d) industry (e) intensive animal husbandry (f) horse keeping (g) commercial forestry.	Minister responsible for the administration of the *River Murray Act 2003.*	To provide expert technical assessment and direction to the relevant authority on matters regarding the taking of water, to ensure development is undertaken sustainably in the Murray-Darling Basin.	Development of a class to which Schedule 9 clause 3 item 10 of the Planning, Development and Infrastructure (General) Regulations 2017 applies.

Native Vegetation Overlay

Assessment Provisions (AP)

Desired Outcome (DO)

Desired Outcome	
DO 1	Areas of native vegetation are protected, retained and restored in order to sustain biodiversity, threatened species and vegetation communities, fauna habitat, ecosystem services, carbon storage and amenity values.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
Environmental Protection	
PO 1.1 Development avoids, or where it cannot be practically avoided, minimises the clearance of native vegetation taking into account the	DTS/DPF 1.1 An application is accompanied by:

siting of buildings, access points, bushfire protection measures and building maintenance.	(a) a declaration stating that the proposal will not, or would not, involve clearance of native vegetation under the Native Vegetation Act 1991, including any clearance that may occur: (i) in connection with a relevant access point and / or driveway (ii) within 10m of a building (other than a residential building or tourist accommodation) (iii) within 20m of a dwelling or addition to an existing dwelling for fire prevention and control (iv) within 50m of residential or tourist accommodation in connection with a requirement under a relevant overlay to establish an asset protection zone in a bushfire prone area or (b) a report prepared in accordance with Regulation 18(2)(a) of the Native Vegetation Regulations 2017 that establishes that the clearance is categorised as 'Level 1 clearance'.
PO 1.2 Native vegetation clearance in association with development avoids the following: (a) significant wildlife habitat and movement corridors (b) rare, vulnerable or endangered plants species (c) native vegetation that is significant because it is located in an area which has been extensively cleared (d) native vegetation that is growing in, or in association with, a wetland environment.	DTS/DPF 1.2 None are applicable.
PO 1.3 Intensive animal husbandry, commercial forestry and agricultural activities are sited, set back and designed to minimise impacts on native vegetation, including impacts on native vegetation in an adjacent State Significant Native Vegetation Area, from: (a) in the case of commercial forestry, the spread of fires from a plantation (b) the spread of pest plants and phytophthora (c) the spread of non-indigenous plants species (d) excessive nutrient loading of the soil or loading arising from surface water runoff (e) soil compaction (f) chemical spray drift.	DTS/DPF 1.3 Development within 500 metres of a boundary of a State Significant Native Vegetation Area does not involve any of the following: (a) horticulture (b) intensive animal husbandry (c) dairy (d) commercial forestry (e) aquaculture.
PO 1.4 Development restores and enhances biodiversity and habitat values through revegetation using locally indigenous plant species.	DTS/DPF 1.4 None are applicable.
Land division	
PO 2.1 Land division does not result in the fragmentation of land containing native vegetation, or necessitate the clearance of native vegetation, unless such clearance is considered minor, taking into account the location of allotment boundaries, access ways, fire breaks, boundary fencing and potential building siting or the like.	DTS/DPF 2.1 Land division where: (a) an application is accompanied by one of the following: (i) a declaration stating that none of the allotments in the proposed plan of division contain native vegetation under the *Native Vegetation Act 1991* (ii) a declaration stating that no native vegetation clearance under the *Native Vegetation Act 1991* will be required as a result of the division of land (iii) a report prepared in accordance with Regulation 18(2)(a) of the Native Vegetation Regulations 2017 that establishes that the vegetation to be cleared is categorised as 'Level 1 clearance' or

	(b) an application for land division which is being considered concurrently with a proposal to develop each allotment which will satisfy, or would satisfy, the requirements of DTS/DPF 1.1, including any clearance that may occur or (c) the division is to support a Heritage Agreement under the Native Vegetation Act 1991 or the *Heritage Places Act 1993*.

Procedural Matters (PM) - Referrals

The following table identifies classes of development / activities that require referral in this Overlay and the applicable referral body. It sets out the purpose of the referral as well as the relevant statutory reference from Schedule 9 of the Planning, Development and Infrastructure (General) Regulations 2017.

Class of Development / Activity	Referral Body	Purpose of Referral	Statutory Reference
Development that is the subject of a report prepared in accordance with Regulation 18(2)(a) of the *Native Vegetation Regulations 2017* that categorises the clearance, or potential clearance, as 'Level 3 clearance' or 'Level 4 clearance'.	Native Vegetation Council	To provide expert assessment and direction to the relevant authority on the potential impacts of development on native vegetation.	Development of a class to which Schedule 9 clause 3 item 11 of the Planning, Development and Infrastructure (General) Regulations 2017 applies.

Water Resources Overlay

Assessment Provisions (AP)

Desired Outcome (DO)

	Desired Outcome
DO 1	Protection of the quality of surface waters considering adverse water quality impacts associated with projected reductions in rainfall and warmer air temperatures as a result of climate change.
DO 2	Maintain the conveyance function and natural flow paths of watercourses to assist in the management of flood waters and stormwater runoff.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
Water Catchment	
PO 1.1 Watercourses and their beds, banks, wetlands and floodplains (1% AEP flood extent) are not damaged or modified and are retained in their natural state, except where modification is required for essential access or maintenance purposes.	DTS/DPF 1.1 None are applicable.

PO 1.2 Development avoids interfering with the existing hydrology or water regime of swamps and wetlands other than to improve the existing conditions to enhance environmental values.	DTS/DPF 1.2 None are applicable.
PO 1.3 Wetlands and low-lying areas providing habitat for native flora and fauna are not drained, except temporarily for essential management purposes to enhance environmental values.	DTS/DPF 1.3 None are applicable.
PO 1.4 Watercourses, areas of remnant native vegetation, or areas prone to erosion that are capable of natural regeneration are fenced off to limit stock access.	DTS/DPF 1.4 None are applicable.
PO 1.5 Development that increases surface water run-off includes a suitably sized strip of vegetated land on each side of a watercourse to filter runoff to: (a) reduce the impacts on native aquatic ecosystems (b) minimise soil loss eroding into the watercourse.	DTS/DPF 1.5 A strip of land 20m or more wide measured from the top of existing banks on each side of the watercourse is free from development, livestock use and revegetated with locally indigenous vegetation.
PO 1.6 Development resulting in the depositing or placing of an object or solid material in a watercourse or lake occurs only where it involves any of the following: (a) the construction of an erosion control structure (b) devices or structures used to extract or regulate water flowing in a watercourse (c) devices used for scientific purposes (d) the rehabilitation of watercourses.	DTS/DPF 1.6 None are applicable.
PO 1.7 Watercourses, floodplains (1% AEP flood extent) and wetlands protected and enhanced by retaining and protecting existing native vegetation.	DTS/DPF 1.7 None are applicable.
PO 1.8 Watercourses, floodplains (1% AEP flood extent) and wetlands are protected and enhanced by stabilising watercourse banks and reducing sediments and nutrients entering the watercourse.	DTS/DPF 1.8 None are applicable.
PO 1.9 Dams, water tanks and diversion drains are located and constructed to maintain the quality and quantity of flows required to meet environmental and downstream needs.	DTS/DPF 1.9 None are applicable.

Procedural Matters (PM) - Referrals

The following table identifies classes of development / activities that require referral in this Overlay and the applicable referral body. It sets out the purpose of the referral as well as the relevant statutory reference from Schedule 9 of the Planning, Development and Infrastructure (General) Regulations 2017.

Class of Development / Activity	Referral Body	Purpose of Referral	Statutory Reference
None	None	None	None

Part 4 - General Development Policies

Advertisements

Assessment Provisions (AP)

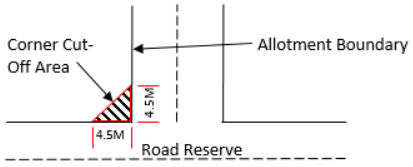
Desired Outcome (DO)

Desired Outcome	
DO 1	Advertisements and advertising hoardings are appropriate to context, efficient and effective in communicating with the public, limited in number to avoid clutter, and do not create hazard.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
Appearance	
PO 1.1 Advertisements are compatible and integrated with the design of the building and/or land they are located on.	DTS/DPF 1.1 Advertisements attached to a building satisfy all of the following: (a) are not located in a Neighbourhood-type zone (b) where they are flush with a wall: (i) if located at canopy level, are in the form of a fascia sign (ii) if located above canopy level: A. do not have any part rising above parapet height B. are not attached to the roof of the building (c) where they are not flush with a wall: (i) if attached to a verandah, no part of the advertisement protrudes beyond the outer limits of the verandah structure (ii) if attached to a two-storey building: A. has no part located above the finished floor level of the second storey of the building B. does not protrude beyond the outer limits of any verandah structure below C. does not have a sign face that exceeds 1m2 per side. (d) if located below canopy level, are flush with a wall (e) if located at canopy level, are in the form of a fascia sign (f) if located above a canopy: (i) are flush with a wall (ii) do not have any part rising above parapet height (iii) are not attached to the roof of the building. (g) if attached to a verandah, no part of the advertisement protrudes beyond the outer limits of the verandah structure (h) if attached to a two-storey building, have no part located above the finished floor level of the second storey of the building

	(i) where they are flush with a wall, do not, in combination with any other existing sign, cover more than 15% of the building facade to which they are attached.
PO 1.2 Advertising hoardings do not disfigure the appearance of the land upon which they are situated or the character of the locality.	DTS/DPF 1.2 Where development comprises an advertising hoarding, the supporting structure is: (a) concealed by the associated advertisement and decorative detailing or (b) not visible from an adjacent public street or thoroughfare, other than a support structure in the form of a single or dual post design.
PO 1.3 Advertising does not encroach on public land or the land of an adjacent allotment.	DTS/DPF 1.3 Advertisements and/or advertising hoardings are contained within the boundaries of the site.
PO 1.4 Where possible, advertisements on public land are integrated with existing structures and infrastructure.	DTS/DPF 1.4 Advertisements on public land that meet at least one of the following: (a) achieves Advertisements DTS/DPF 1.1 (b) are integrated with a bus shelter.
PO 1.5 Advertisements and/or advertising hoardings are of a scale and size appropriate to the character of the locality.	DTS/DPF 1.5 None are applicable.
Proliferation of Advertisements	
PO 2.1 Proliferation of advertisements is minimised to avoid visual clutter and untidiness.	DTS/DPF 2.1 No more than one freestanding advertisement is displayed per occupancy.
PO 2.2 Multiple business or activity advertisements are co-located and coordinated to avoid visual clutter and untidiness.	DTS/DPF 2.2 Advertising of a multiple business or activity complex is located on a single advertisement fixture or structure.
PO 2.3 Proliferation of advertisements attached to buildings is minimised to avoid visual clutter and untidiness.	DTS/DPF 2.3 Advertisements satisfy all of the following: (a) are attached to a building (b) other than in a Neighbourhood-type zone, where they are flush with a wall, cover no more than 15% of the building facade to which they are attached (c) do not result in more than one sign per occupancy that is not flush with a wall.
Advertising Content	
PO 3.1 Advertisements are limited to information relating to the lawful use of land they are located on to assist in the ready identification of the activity or activities on the land and avoid unrelated content that contributes to visual clutter and untidiness.	DTS/DPF 3.1 Advertisements contain information limited to a lawful existing or proposed activity or activities on the same site as the advertisement.
Amenity Impacts	
PO 4.1 Light spill from advertisement illumination does not unreasonably compromise the amenity of sensitive receivers.	DTS/DPF 4.1 Advertisements do not incorporate any illumination.
Safety	
PO 5.1	DTS/DPF 5.1

Advertisements and/or advertising hoardings erected on a verandah or projecting from a building wall are designed and located to allow for safe and convenient pedestrian access.	Advertisements have a minimum clearance of 2.5m between the top of the footpath and base of the underside of the sign.
PO 5.2 Advertisements and/or advertising hoardings do not distract or create a hazard to drivers through excessive illumination.	DTS/DPF 5.2 No advertisement illumination is proposed.
PO 5.3 Advertisements and/or advertising hoardings do not create a hazard to drivers by: (a) being liable to interpretation by drivers as an official traffic sign or signal (b) obscuring or impairing drivers' view of official traffic signs or signals (c) obscuring or impairing drivers' view of features of a road that are potentially hazardous (such as junctions, bends, changes in width and traffic control devices) or other road or rail vehicles at/or approaching level crossings.	DTS/DPF 5.3 Advertisements satisfy all of the following: (a) are not located in a public road or rail reserve (b) are located wholly outside the land shown as 'Corner Cut-Off Area' in the following diagram 
PO 5.4 Advertisements and/or advertising hoardings do not create a hazard by distracting drivers from the primary driving task at a location where the demands on driver concentration are high.	DTS/DPF 5.4 Advertisements and/or advertising hoardings are not located along or adjacent to a road having a speed limit of 80km/h or more.
PO 5.5 Advertisements and/or advertising hoardings provide sufficient clearance from the road carriageway to allow for safe and convenient movement by all road users.	DTS/DPF 5.5 Where the advertisement or advertising hoarding is: (a) on a kerbed road with a speed zone of 60km/h or less, the advertisement or advertising hoarding is located at least 0.6m from the roadside edge of the kerb (b) on an unkerbed road with a speed zone of 60km/h or less, the advertisement or advertising hoarding is located at least 5.5m from the edge of the seal (c) on any other kerbed or unkerbed road, the advertisement or advertising hoarding is located a minimum of the following distance from the roadside edge of the kerb or the seal: (a) 110 km/h road - 14m (b) 100 km/h road - 13m (c) 90 km/h road - 10m (d) 70 or 80 km/h road - 8.5m.
PO 5.6 Advertising near signalised intersections does not cause unreasonable distraction to road users through illumination, flashing lights, or moving or changing displays or messages.	DTS/DPF 5.6 Advertising: (a) is not illuminated (b) does not incorporate a moving or changing display or message (c) does not incorporate a flashing light(s).

Animal Keeping and Horse Keeping

Assessment Provisions (AP)

Desired Outcome (DO)

Desired Outcome	
DO 1	Animals are kept at a density that is not beyond the carrying capacity of the land and in a manner that minimises their adverse effects on the environment, local amenity and surrounding development.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
Siting and Design	
PO 1.1 Animal keeping, horse keeping and associated activities do not create adverse impacts on the environment or the amenity of the locality.	DTS/DPF 1.1 None are applicable.
PO 1.2 Animal keeping and horse keeping is located and managed to minimise the potential transmission of disease to other operations where animals are kept.	DTS/DPF 1.2 None are applicable.
Horse Keeping	
PO 2.1 Water from stable wash-down areas is directed to appropriate absorption areas and/or drainage pits to minimise pollution of land and water.	DTS/DPF 2.1 None are applicable.
PO 2.2 Stables, horse shelters or associated yards are sited appropriate distances away from sensitive receivers and/or allotments in other ownership to avoid adverse impacts from dust, erosion and odour.	DTS/DPF 2.2 Stables, horse shelters and associated yards are sited in accordance with all of the following: (a) 30m or more from any sensitive receivers (existing or approved) on land in other ownership (b) where an adjacent allotment is vacant and in other ownership, 30m or more from the boundary of that allotment.
PO 2.3 All areas accessible to horses are separated from septic tank effluent disposal areas to protect the integrity of that system. Stable flooring is constructed with an impervious material to facilitate regular cleaning.	DTS/DPF 2.3 Septic tank effluent disposal areas are enclosed with a horse-proof barrier such as a fence to exclude horses from this area.
PO 2.4 To minimise environmental harm and adverse impacts on water resources, stables, horse shelters and associated yards are appropriately set back from a watercourse.	DTS/DPF 2.4 Stables, horse shelters and associated yards are set back 50m or more from a watercourse.
PO 2.5 Stables, horse shelters and associated yards are located on slopes that are stable to minimise the risk of soil erosion and water runoff.	DTS/DPF 2.5 Stables, horse shelters and associated yards are not located on land with a slope greater than 10% (1-in-10).
Kennels	
PO 3.1 Kennel flooring is constructed with an impervious material to facilitate regular cleaning.	DTS/DPF 3.1 The floors of kennels satisfy all of the following: (a) are constructed of impervious concrete (b) are designed to be self-draining when washed down.
PO 3.2 Kennels and exercise yards are designed and sited to minimise noise nuisance to neighbours through measures such as: (a) adopting appropriate separation distances	DTS/DPF 3.2 Kennels are sited 500m or more from the nearest sensitive receiver on land in other ownership.

(b) orientating openings away from sensitive receivers.	
PO 3.3 Dogs are regularly observed and managed to minimise nuisance impact on adjoining sensitive receivers from animal behaviour.	DTS/DPF 3.3 Kennels are sited in association with a permanent dwelling on the land.
Wastes	
PO 4.1 Storage of manure, used litter and other wastes (other than wastewater lagoons) is designed, constructed and managed to minimise attracting and harbouring vermin.	DTS/DPF 4.1 None are applicable.
PO 4.2 Facilities for the storage of manure, used litter and other wastes (other than wastewater lagoons) are located to minimise the potential for polluting water resources.	DTS/DPF 4.2 Waste storage facilities (other than wastewater lagoons) are located outside the 1% AEP flood event areas.

Aquaculture

Assessment Provisions (AP)

Desired Outcome (DO)

Desired Outcome	
DO 1	Aquaculture facilities are developed in an ecologically, economically and socially sustainable manner to support an equitable sharing of marine, coastal and inland resources and mitigate conflict with other water-based and land-based uses.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
Land-based Aquaculture	
PO 1.1 Land-based aquaculture and associated components are sited and designed to mitigate adverse impacts on nearby sensitive receivers.	DTS/DPF 1.1 Land-based aquaculture and associated components are located to satisfy all of the following: (a) 200m or more from a sensitive receiver in other ownership (b) 500m or more from the boundary of a zone primarily intended to accommodate sensitive receivers or The development is the subject of an aquaculture lease and/or licence (as applicable) granted under the *Aquaculture Act 2001*.
PO 1.2 Land-based aquaculture and associated components are sited and designed to prevent surface flows from entering ponds in a 1% AEP sea flood level event.	DTS/DPF 1.2 None are applicable.
PO 1.3 Land-based aquaculture and associated components are sited and designed to prevent pond leakage that would pollute groundwater.	DTS/DPF 1.3 The development is the subject of an aquaculture lease and/or licence (as applicable) granted under the *Aquaculture Act 2001*.
PO 1.4	DTS/DPF 1.4

Land-based aquaculture and associated components are sited and designed to prevent farmed species escaping and entering into any waters.	The development is the subject of an aquaculture lease and/or licence (as applicable) granted under the *Aquaculture Act 2001*.
PO 1.5 Land-based aquaculture and associated components, including intake and discharge pipes, are designed to minimise the need to traverse sensitive areas to minimise impact on the natural environment.	DTS/DPF 1.5 None are applicable.
PO 1.6 Pipe inlets and outlets associated with land-based aquaculture are sited and designed to minimise the risk of disease transmission.	DTS/DPF 1.6 The development is the subject of an aquaculture lease and/or licence (as applicable) granted under the *Aquaculture Act 2001*.
PO 1.7 Storage areas associated with aquaculture activity are integrated with the use of the land and sited and designed to minimise their visual impact on the surrounding environment.	DTS/DPF 1.7 None are applicable.
Marine Based Aquaculture	
PO 2.1 Marine aquaculture is sited and designed to minimise its adverse impacts on sensitive ecological areas including: (a) creeks and estuaries (b) wetlands (c) significant seagrass and mangrove communities (d) marine habitats and ecosystems.	DTS/DPF 2.1 None are applicable.
PO 2.2 Marine aquaculture is sited in areas with adequate water current to disperse sediments and dissolve particulate wastes to prevent the build-up of waste that may cause environmental harm.	DTS/DPF 2.2 The development is the subject of an aquaculture lease and/or licence (as applicable) granted under the *Aquaculture Act 2001*.
PO 2.3 Marine aquaculture is designed to not involve discharge of human waste on the site, on any adjacent land or into nearby waters.	DTS/DPF 2.3 The development does not include toilet facilities located over water.
PO 2.4 Marine aquaculture (other than inter-tidal aquaculture) is located an appropriate distance seaward of the high water mark.	DTS/DPF 2.4 Marine aquaculture development is located 100m or more seaward of the high water mark or The development is the subject of an aquaculture lease and/or licence (as applicable) granted under the *Aquaculture Act 2001*.
PO 2.5 Marine aquaculture is sited and designed to not obstruct or interfere with: (a) areas of high public use (b) areas, including beaches, used for recreational activities such as swimming, fishing, skiing, sailing and other water sports (c) areas of outstanding visual or environmental value (d) areas of high tourism value (e) areas of important regional or state economic activity, including commercial ports, wharfs and jetties (f) the operation of infrastructure facilities including inlet and outlet pipes associated with the desalination of sea water.	DTS/DPF 2.5 None are applicable.
PO 2.6 Marine aquaculture is sited and designed to minimise interference and obstruction to the natural processes of the coastal and marine	DTS/DPF 2.6 None are applicable.

environment.	
PO 2.7 Marine aquaculture is designed to be as unobtrusive as practicable by incorporating measures such as: (a) using feed hoppers painted in subdued colours and suspending them as close as possible to the surface of the water (b) positioning structures to protrude the minimum distance practicable above the surface of the water (c) avoiding the use of shelters and structures above cages and platforms unless necessary to exclude predators and protected species from interacting with the farming structures and/or stock inside the cages, or for safety reasons (d) positioning racks, floats and other farm structures in unobtrusive locations landward from the shoreline.	DTS/DPF 2.7 None are applicable.
PO 2.8 Access, launching and maintenance facilities utilise existing established roads, tracks, ramps and paths to or from the sea where possible to minimise environmental and amenity impacts.	DTS/DPF 2.8 The development utilises existing established roads, tracks, ramps and/or paths (as applicable) to access the sea.
PO 2.9 Access, launching and maintenance facilities are developed as common user facilities and are co-located where practicable to mitigate adverse impacts on coastal areas.	DTS/DPF 2.9 The development utilises existing established roads, tracks, ramps and/or paths (as applicable) to access the sea.
PO 2.10 Marine aquaculture is sited to minimise potential impacts on, and to protect the integrity of, reserves under the *National Parks and Wildlife Act 1972*.	DTS/DPF 2.10 Marine aquaculture is located 1000m or more seaward of the boundary of any reserve under the *National Parks and Wildlife Act 1972*.
PO 2.11 Onshore storage, cooling and processing facilities do not impair the coastline and its visual amenity by: (a) being sited, designed, landscaped and of a scale to reduce the overall bulk and appearance of buildings and complement the coastal landscape (b) making provision for appropriately sited and designed vehicular access arrangements, including using existing vehicular access arrangements as far as practicable (c) incorporating appropriate waste treatment and disposal.	DTS/DPF 2.11 The development does not include any onshore facilities in conjunction with a proposal for marine aquaculture.
Navigation and Safety	
PO 3.1 Marine aquaculture sites are suitably marked to maintain navigational safety.	DTS/DPF 3.1 The development is the subject of an aquaculture lease and/or licence (as applicable) granted under the *Aquaculture Act 2001*.
PO 3.2 Marine aquaculture is sited to provide adequate separation between farms for safe navigation.	DTS/DPF 3.2 The development is the subject of an aquaculture lease and/or licence (as applicable) granted under the *Aquaculture Act 2001*.
Environmental Management	
PO 4.1 Marine aquaculture is maintained to prevent hazards to people and wildlife, including breeding grounds and habitats of native marine mammals and terrestrial fauna, especially migratory species.	DTS/DPF 4.1 None are applicable.
PO 4.2 Marine aquaculture is designed to facilitate the relocation or removal of structures in the case of emergency such as oil spills, algal blooms and altered water flows.	DTS/DPF 4.2 None are applicable.

PO 4.3 Marine aquaculture provides for progressive or future reclamation of disturbed areas ahead of, or upon, decommissioning.	DTS/DPF 4.3 None are applicable.
PO 4.4 Aquaculture operations incorporate measures for the removal and disposal of litter, disused material, shells, debris, detritus, dead animals and animal waste to prevent pollution of waters, wetlands, or the nearby coastline.	DTS/DPF 4.4 The development is the subject of an aquaculture lease and/or licence (as applicable) granted under the *Aquaculture Act 2001*.

Beverage Production in Rural Areas

Assessment Provisions (AP)

Desired Outcome (DO)

Desired Outcome	
DO 1	Mitigation of potential amenity and environmental impacts of value-adding beverage production facilities such as wineries, distilleries, cideries and breweries.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
Odour and Noise	
PO 1.1 Beverage production activities are designed and sited to minimise odour impacts on rural amenity.	DTS/DPF 1.1 None are applicable.
PO 1.2 Beverage production activities are designed and sited to minimise noise impacts on sensitive receivers.	DTS/DPF 1.2 None are applicable.
PO 1.3 Fermentation, distillation, manufacturing, storage, packaging and bottling activities occur within enclosed buildings to improve the visual appearance within a locality and manage noise associated with these activities.	DTS/DPF 1.3 None are applicable.
PO 1.4 Breweries are designed to minimise odours emitted during boiling and fermentation stages of production.	DTS/DPF 1.4 Brew kettles are fitted with a vapour condenser.
PO 1.5 Beverage production solid wastes are stored in a manner that minimises odour impacts on sensitive receivers in other ownership.	DTS/DPF 1.5 Solid waste from beverage production is collected and stored in sealed containers and removed from the site within 48 hours.
Water Quality	
PO 2.1 Beverage production wastewater management systems (including wastewater irrigation) are set back from watercourses to minimise adverse impacts on water resources.	DTS/DPF 2.1 Wastewater management systems are set back 50m or more from the banks of watercourses and bores.

PO 2.2 The storage or disposal of chemicals or hazardous substances is undertaken in a manner to prevent pollution of water resources.	DTS/DPF 2.2 None are applicable.
PO 2.3 Stormwater runoff from areas that may cause contamination due to beverage production activities (including vehicle movements and machinery operations) is drained to an onsite stormwater treatment system to manage potential environmental impacts.	DTS/DPF 2.3 None are applicable.
PO 2.4 Stormwater runoff from areas unlikely to cause contamination by beverage production and associated activities (such as roof catchments and clean hard-paved surfaces) is diverted away from beverage production areas and wastewater management systems.	DTS/DPF 2.4 None are applicable.
Wastewater Irrigation	
PO 3.1 Beverage production wastewater irrigation systems are designed and located to not contaminate soil and surface and ground water resources or damage crops.	DTS/DPF 3.1 None are applicable.
PO 3.2 Beverage production wastewater irrigation systems are designed and located to minimise impact on amenity and avoid spray drift onto adjoining land.	DTS/DPF 3.2 Beverage production wastewater is not irrigated within 50m of any dwelling in other ownership.
PO 3.3 Beverage production wastewater is not irrigated onto areas that pose an undue risk to the environment or amenity such as: (a) waterlogged areas (b) land within 50m of a creek, swamp or domestic or stock water bore (c) land subject to flooding (d) steeply sloping land (e) rocky or highly permeable soil overlaying an unconfined aquifer.	DTS/DPF 3.3 None are applicable.

Bulk Handling and Storage Facilities

Assessment Provisions (AP)

Desired Outcome (DO)

	Desired Outcome
DO 1	Facilities for the bulk handling and storage of agricultural, mineral, petroleum, rock, ore or other similar commodities are designed to minimise adverse impacts on transport networks, the landscape and surrounding land uses.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
Siting and Design	

PO 1.1 Bulk handling and storage facilities are sited and designed to minimise risks of adverse air quality and noise impacts on sensitive receivers.	DTS/DPF 1.1 Facilities for the handling, storage and dispatch of commodities in bulk (excluding processing) meet the following minimum separation distances from sensitive receivers: (a) bulk handling of agricultural crop products, rock, ores, minerals, petroleum products or chemicals at a wharf or wharf side facility (including sea-port grain terminals), where the handling of these materials into or from vessels does not exceed 100 tonnes per day: 300m or more from residential premises not associated with the facility (b) bulk handling of agricultural crop products, rock, ores, minerals, petroleum products or chemicals to or from any commercial storage facility: 300m or more from residential premises not associated with the facility (c) bulk petroleum storage involving individual containers with a capacity up to 200 litres and a total on-site storage capacity not exceeding 1,000 cubic metres: 500m or more (d) coal handling with: a. capacity up to 1 tonne per day or a storage capacity up to 50 tonnes: 500m or more b. capacity exceeding 1 tonne per day but not exceeding 100 tonnes per day or a storage capacity exceeding 50 tonnes but not exceeding 5000 tonnes: 1000m or more.
Buffers and Landscaping	
PO 2.1 Bulk handling and storage facilities incorporate a buffer area for the establishment of dense landscaping adjacent road frontages to enhance the appearance of land and buildings from public thoroughfares.	DTS/DPF 2.1 None are applicable.
PO 2.2 Bulk handling and storage facilities incorporate landscaping to assist with screening and dust filtration.	DTS/DPF 2.2 None are applicable.
Access and Parking	
PO 3.1 Roadways and vehicle parking areas associated with bulk handling and storage facilities are designed and surfaced to control dust emissions and prevent drag out of material from the site.	DTS/DPF 3.1 Roadways and vehicle parking areas are sealed with an all-weather surface.
Slipways, Wharves and Pontoons	
PO 4.1 Slipways, wharves and pontoons used for the handling of bulk materials (such as fuel, oil, catch, bait and the like) incorporate catchment devices to avoid the release of materials into adjacent waters.	DTS/DPF 4.1 None are applicable.

Clearance from Overhead Powerlines

Assessment Provisions (AP)

Desired Outcome (DO)

Desired Outcome	
DO 1	Protection of human health and safety when undertaking development in the vicinity of overhead transmission powerlines.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
PO 1.1 Buildings are adequately separated from aboveground powerlines to minimise potential hazard to people and property.	DTS/DPF 1.1 One of the following is satisfied: (a) a declaration is provided by or on behalf of the applicant to the effect that the proposal would not be contrary to the regulations prescribed for the purposes of section 86 of the *Electricity Act 1996* (b) there are no aboveground powerlines adjoining the site that are the subject of the proposed development.

Design

Assessment Provisions (AP)

Desired Outcome (DO)

Desired Outcome	
DO 1	Development is: (a) contextual - by considering, recognising and carefully responding to its natural surroundings or built environment and positively contributes to the character of the immediate area (b) durable - fit for purpose, adaptable and long lasting (c) inclusive - by integrating landscape design to optimise pedestrian and cyclist usability, privacy and equitable access, and promoting the provision of quality spaces integrated with the public realm that can be used for access and recreation and help optimise security and safety both internally and within the public realm, for occupants and visitors (d) sustainable - by integrating sustainable techniques into the design and siting of development and landscaping to improve community health, urban heat, water management, environmental performance, biodiversity and local amenity and to minimise energy consumption.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
All development	
External Appearance	
PO 1.1 Buildings reinforce corners through changes in setback, articulation, materials, colour and massing (including height, width, bulk, roof form and slope).	DTS/DPF 1.1 None are applicable.
PO 1.2 Where zero or minor setbacks are desirable, development provides shelter over footpaths (in the form of verandahs, awnings, canopies and the like, with adequate lighting) to positively contribute to the walkability, comfort and safety of the public realm.	DTS/DPF 1.2 None are applicable.
PO 1.3 Building elevations facing the primary street (other than ancillary buildings) are designed and detailed to convey purpose, identify main access points and complement the streetscape.	DTS/DPF 1.3 None are applicable.
PO 1.4	DTS/DPF 1.4

Plant, exhaust and intake vents and other technical equipment is integrated into the building design to minimise visibility from the public realm and negative impacts on residential amenity by: (a) positioning plant and equipment in unobtrusive locations viewed from public roads and spaces (b) screening rooftop plant and equipment from view (c) when located on the roof of non-residential development, locating the plant and equipment as far as practicable from adjacent sensitive land uses.	Development does not incorporate any structures that protrude beyond the roofline.
PO 1.5 The negative visual impact of outdoor storage, waste management, loading and service areas is minimised by integrating them into the building design and screening them from public view (such as fencing, landscaping and built form) taking into account the form of development contemplated in the relevant zone.	DTS/DPF 1.5 None are applicable.
Safety	
PO 2.1 Development maximises opportunities for passive surveillance of the public realm by providing clear lines of sight, appropriate lighting and the use of visually permeable screening wherever practicable.	DTS/DPF 2.1 None are applicable.
PO 2.2 Development is designed to differentiate public, communal and private areas.	DTS/DPF 2.2 None are applicable.
PO 2.3 Buildings are designed with safe, perceptible and direct access from public street frontages and vehicle parking areas.	DTS/DPF 2.3 None are applicable.
PO 2.4 Development at street level is designed to maximise opportunities for passive surveillance of the adjacent public realm.	DTS/DPF 2.4 None are applicable.
PO 2.5 Common areas and entry points of buildings (such as the foyer areas of residential buildings), and non-residential land uses at street level, maximise passive surveillance from the public realm to the inside of the building at night.	DTS/DPF 2.5 None are applicable.
Landscaping	
PO 3.1 Soft landscaping and tree planting is incorporated to: (a) minimise heat absorption and reflection (b) maximise shade and shelter (c) maximise stormwater infiltration (d) enhance the appearance of land and streetscapes (e) contribute to biodiversity.	DTS/DPF 3.1 None are applicable.
PO 3.2 Soft landscaping and tree planting maximises the use of locally indigenous plant species, incorporates plant species best suited to current and future climate conditions and avoids pest plant and weed species.	DTS/DPF 3.2 None are applicable.
Environmental Performance	
PO 4.1 Buildings are sited, oriented and designed to maximise natural sunlight	DTS/DPF 4.1 None are applicable.

access and ventilation to main activity areas, habitable rooms, common areas and open spaces.	
PO 4.2 Buildings are sited and designed to maximise passive environmental performance and minimise energy consumption and reliance on mechanical systems, such as heating and cooling.	DTS/DPF 4.2 None are applicable.
PO 4.3 Buildings incorporate climate-responsive techniques and features such as building and window orientation, use of eaves, verandahs and shading structures, water harvesting, at ground landscaping, green walls, green roofs and photovoltaic cells.	DTS/DPF 4.3 None are applicable.
Water Sensitive Design	
PO 5.1 Development is sited and designed to maintain natural hydrological systems without negatively impacting: (a) the quantity and quality of surface water and groundwater (b) the depth and directional flow of surface water and groundwater (c) the quality and function of natural springs.	DTS/DPF 5.1 None are applicable.
On-site Waste Treatment Systems	
PO 6.1 Dedicated on-site effluent disposal areas do not include any areas to be used for, or could be reasonably foreseen to be used for, private open space, driveways or car parking.	DTS/DPF 6.1 Effluent disposal drainage areas do not: (a) encroach within an area used as private open space or result in less private open space than that specified in Design Table 1 - Private Open Space (b) use an area also used as a driveway (c) encroach within an area used for on-site car parking or result in less on-site car parking than that specified in Transport, Access and Parking Table 1 - General Off-Street Car Parking Requirements or Table 2 - Off-Street Car Parking Requirements in Designated Areas.
Carparking Appearance	
PO 7.1 Development facing the street is designed to minimise the negative impacts of any semi-basement and undercroft car parking on the streetscapes through techniques such as: (a) limiting protrusion above finished ground level (b) screening through appropriate planting, fencing and mounding (c) limiting the width of openings and integrating them into the building structure.	DTS/DPF 7.1 None are applicable.
PO 7.2 Vehicle parking areas are appropriately located, designed and constructed to minimise impacts on adjacent sensitive receivers through measures such as ensuring they are attractively developed and landscaped, screen fenced and the like.	DTS/DPF 7.2 None are applicable.
PO 7.3 Safe, legible, direct and accessible pedestrian connections are provided between parking areas and the development.	DTS/DPF 7.3 None are applicable.
PO 7.4 Street level vehicle parking areas incorporate tree planting to provide shade and reduce solar heat absorption and reflection.	DTS/DPF 7.4 None are applicable.

PO 7.5 Street level parking areas incorporate soft landscaping to improve visual appearance when viewed from within the site and from public places.	DTS/DPF 7.5 None are applicable.
PO 7.6 Vehicle parking areas and associated driveways are landscaped to provide shade and positively contribute to amenity.	DTS/DPF 7.6 None are applicable.
PO 7.7 Vehicle parking areas and access ways incorporate integrated stormwater management techniques such as permeable or porous surfaces, infiltration systems, drainage swales or rain gardens that integrate with soft landscaping.	DTS/DPF 7.7 None are applicable.
Earthworks and sloping land	
PO 8.1 Development, including any associated driveways and access tracks, minimises the need for earthworks to limit disturbance to natural topography.	DTS/DPF 8.1 Development does not involve any of the following: (a) excavation exceeding a vertical height of 1m (b) filling exceeding a vertical height of 1m (c) a total combined excavation and filling vertical height of 2m or more.
PO 8.2 Driveways and access tracks are designed and constructed to allow safe and convenient access on sloping land (with a gradient exceeding 1 in 8).	DTS/DPF 8.2 Driveways and access tracks on sloping land (with a gradient exceeding 1 in 8) satisfy (a) and (b): (a) do not have a gradient exceeding 25% (1-in-4) at any point along the driveway (b) are constructed with an all-weather trafficable surface.
PO 8.3 Driveways and access tracks on sloping land (with a gradient exceeding 1 in 8): (a) do not contribute to the instability of embankments and cuttings (b) provide level transition areas for the safe movement of people and goods to and from the development (c) are designed to integrate with the natural topography of the land.	DTS/DPF 8.3 None are applicable.
PO 8.4 Development on sloping land (with a gradient exceeding 1 in 8) avoids the alteration of natural drainage lines and includes on-site drainage systems to minimise erosion.	DTS/DPF 8.4 None are applicable.
PO 8.5 Development does not occur on land at risk of landslip nor increases the potential for landslip or land surface instability.	DTS/DPF 8.5 None are applicable.
Fences and Walls	
PO 9.1 Fences, walls and retaining walls are of sufficient height to maintain privacy and security without unreasonably impacting the visual amenity and adjoining land's access to sunlight or the amenity of public places.	DTS/DPF 9.1 None are applicable.
PO 9.2 Landscaping incorporated on the low side of retaining walls is visible	DTS/DPF 9.2 A vegetated landscaped strip 1m wide or more is provided against the

from public roads and public open space to minimise visual impacts.	low side of a retaining wall.
Overlooking / Visual Privacy (in building 3 storeys or less)	
PO 10.1 Development mitigates direct overlooking from upper level windows to habitable rooms and private open spaces of adjoining residential uses.	DTS/DPF 10.1 Upper level windows facing side or rear boundaries shared with a residential allotment/site satisfy one of the following: (a) are permanently obscured to a height of 1.5m above finished floor level and are fixed or not capable of being opened more than 200mm (b) have sill heights greater than or equal to 1.5m above finished floor level (c) incorporate screening with a maximum of 25% openings, permanently fixed no more than 500mm from the window surface and sited adjacent to any part of the window less than 1.5 m above the finished floor level.
PO 10.2 Development mitigates direct overlooking from balconies, terraces and decks to habitable rooms and private open space of adjoining residential uses.	DTS/DPF 10.2 One of the following is satisfied: (a) the longest side of the balcony or terrace will face a public road, public road reserve or public reserve that is at least 15m wide in all places faced by the balcony or terrace or (b) all sides of balconies or terraces on upper building levels are permanently obscured by screening with a maximum 25% transparency/openings fixed to a minimum height of: (i) 1.5m above finished floor level where the balcony is located at least 15 metres from the nearest habitable window of a dwelling on adjacent land or (ii) 1.7m above finished floor level in all other cases
All Residential development	
Front elevations and passive surveillance	
PO 11.1 Dwellings incorporate windows along primary street frontages to encourage passive surveillance and make a positive contribution to the streetscape.	DTS/DPF 11.1 Each dwelling with a frontage to a public street: (a) includes at least one window facing the primary street from a habitable room that has a minimum internal room dimension of 2.4m (b) has an aggregate window area of at least $2m^2$ facing the primary street.
PO 11.2 Dwellings incorporate entry doors within street frontages to address the street and provide a legible entry point for visitors.	DTS/DPF 11.2 Dwellings with a frontage to a public street have an entry door visible from the primary street boundary.
Outlook and amenity	
PO 12.1 Living rooms have an external outlook to provide a high standard of amenity for occupants.	DTS/DPF 12.1 A living room of a dwelling incorporates a window with an outlook towards the street frontage or private open space, public open space, or waterfront areas.
PO 12.2 Bedrooms are separated or shielded from active communal recreation areas, common access areas and vehicle parking areas and access ways to mitigate noise and artificial light intrusion.	DTS/DPF 12.2 None are applicable.
Ancillary Development	

PO 13.1

Residential ancillary buildings and structures are sited and designed to not detract from the streetscape or appearance of buildings on the site or neighbouring properties.

DTS/DPF 13.1

Ancillary buildings:

(a) are ancillary to a dwelling erected on the same site

(b) have a floor area not exceeding 60m2

(c) are not constructed, added to or altered so that any part is situated:

(i) in front of any part of the building line of the dwelling to which it is ancillary

or

(ii) within 900mm of a boundary of the allotment with a secondary street (if the land has boundaries on two or more roads)

(d) in the case of a garage or carport, the garage or carport:

(i) is set back at least 5.5m from the boundary of the primary street

(ii) when facing a primary street or secondary street, has a total door / opening not exceeding:

A. for dwellings of single building level - 7m in width or 50% of the site frontage, whichever is the lesser

B. for dwellings comprising two or more building levels at the building line fronting the same public street - 7m in width

(e) if situated on a boundary (not being a boundary with a primary street or secondary street), do not exceed a length of 11.5m unless:

(i) a longer wall or structure exists on the adjacent site and is situated on the same allotment boundary

and

(ii) the proposed wall or structure will be built along the same length of boundary as the existing adjacent wall or structure to the same or lesser extent

(f) if situated on a boundary of the allotment (not being a boundary with a primary street or secondary street), all walls or structures on the boundary will not exceed 45% of the length of that boundary

(g) will not be located within 3m of any other wall along the same boundary unless on an adjacent site on that boundary there is an existing wall of a building that would be adjacent to or about the proposed wall or structure

(h) have a wall height or post height not exceeding 3m above natural ground level (and not including a gable end)

(i) have a roof height where no part of the roof is more than 5m above the natural ground level

(j) if clad in sheet metal, is pre-colour treated or painted in a non-reflective colour

(k) retains a total area of soft landscaping in accordance with (i) or (ii), whichever is less:

(i) a total area as determined by the following table:

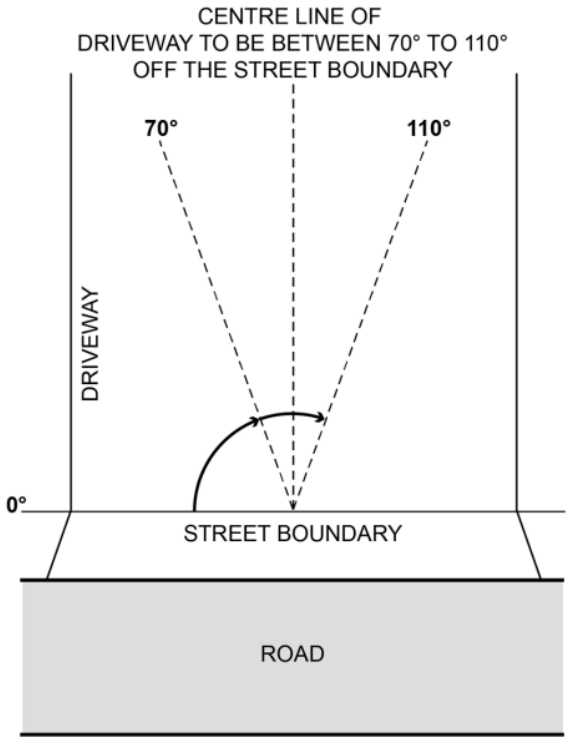
Dwelling site area (or in the case of residential flat building or group dwelling(s), average site area) (m^2)	Minimum percentage of site
<150	10%
150-200	15%
201-450	20%
>450	25%

(ii) the amount of existing soft landscaping prior to the development occurring.

	(l) in relation to ancillary accommodation in the Rural Zone, Productive Rural Landscape Zone, or Rural Horticulture Zone, is located within 20m of an existing dwelling.
PO 13.2 Ancillary buildings and structures do not impede on-site functional requirements such as private open space provision or car parking requirements and do not result in over-development of the site.	DTS/DPF 13.2 Ancillary buildings and structures do not result in: (a) less private open space than specified in Design in Urban Areas Table 1 - Private Open Space (b) less on-site car parking than specified in Transport, Access and Parking Table 1 - General Off-Street Car Parking Requirements or Table 2 - Off-Street Car Parking Requirements in Designated Areas.
PO 13.3 Fixed plant and equipment in the form of pumps and/or filtration systems for a swimming pool or spa is positioned and/or housed to not cause unreasonable noise nuisance to adjacent sensitive receivers.	DTS/DPF 13.3 The pump and/or filtration system is ancillary to a dwelling erected on the same site and is: (a) enclosed in a solid acoustic structure that is located at least 5m from the nearest habitable room located on an adjoining allotment or (b) located at least 12m from the nearest habitable room located on an adjoining allotment.
PO 13.4 Buildings and structures that are ancillary to an existing non-residential use do not detract from the streetscape character, appearance of buildings on the site of the development, or the amenity of neighbouring properties.	DTS/DPF 13.4 Non-residential ancillary buildings and structures: (a) are ancillary and subordinate to an existing non-residential use on the same site (b) have a floor area not exceeding the following: Allotment size: ≤500m2 — Floor area: 60m2; >500m2 — 80m2 (c) are not constructed, added to or altered so that any part is situated: (i) in front of any part of the building line of the main building to which it is ancillary or (ii) within 900mm of a boundary of the allotment with a secondary street (if the land has boundaries on two or more roads) (d) in the case of a garage or carport, the garage or carport: (i) is set back at least 5.5m from the boundary of the primary street (e) if situated on a boundary (not being a boundary with a primary street or secondary street), do not exceed a length of 11.5m unless: (i) a longer wall or structure exists on the adjacent site and is situated on the same allotment boundary (ii) the proposed wall or structure will be built along the same length of boundary as the existing adjacent wall or structure to the same or lesser extent (f) if situated on a boundary of the allotment (not being a boundary with a primary street or secondary street), all walls or structures on the boundary will not exceed 45% of the length of that boundary (g) will not be located within 3m of any other wall along the same boundary unless on an adjacent site on that boundary there is an existing wall of a building that would be adjacent to or about the proposed wall or structure (h) have a wall height (or post height) not exceeding 3m (and not including a gable end) (i) have a roof height where no part of the roof is more than 5m above the natural ground level

	(j) if clad in sheet metal, is pre-colour treated or painted in a non-reflective colour.
Garage appearance	
PO 14.1 Garaging is designed to not detract from the streetscape or appearance of a dwelling.	DTS/DPF 14.1 Garages and carports facing a street: (a) are situated so that no part of the garage or carport is in front of any part of the building line of the dwelling (b) are set back at least 5.5m from the boundary of the primary street (c) have a garage door / opening not exceeding 7m in width (d) have a garage door /opening width not exceeding 50% of the site frontage unless the dwelling has two or more building levels at the building line fronting the same public street.
Massing	
PO 15.1 The visual mass of larger buildings is reduced when viewed from adjoining allotments or public streets.	DTS/DPF 15.1 None are applicable
Dwelling additions	
PO 16.1 Dwelling additions are sited and designed to not detract from the streetscape or amenity of adjoining properties and do not impede on-site functional requirements.	DTS / DPF 16.1 Dwelling additions: (a) are not constructed, added to or altered so that any part is situated closer to a public street (b) do not result in: (i) excavation exceeding a vertical height of 1m (ii) filling exceeding a vertical height of 1m (iii) a total combined excavation and filling vertical height of 2m or more (iv) less Private Open Space than specified in Design Table 1 - Private Open Space (v) less on-site parking than specified in Transport Access and Parking Table 1 - General Off-Street Car Parking Requirements or Table 2 - Off-Street Car Parking Requirements in Designated Areas (vi) upper level windows facing side or rear boundaries unless: A. they are permanently obscured to a height of 1.5m above finished floor level that is fixed or not capable of being opened more than 200mm or B. have sill heights greater than or equal to 1.5m above finished floor level or C. incorporate screening to a height of 1.5m above finished floor level (vii) all sides of balconies or terraces on upper building levels are permanently obscured by screening with a maximum 25% transparency/openings fixed to a minimum height of: A. 1.5m above finished floor level where the balcony is located at least 15 metres from the nearest habitable window of a dwelling on adjacent land B. 1.7m above finished floor level in all other cases.
Private Open Space	

PO 17.1 Dwellings are provided with suitable sized areas of usable private open space to meet the needs of occupants.	DTS/DPF 17.1 Private open space is provided in accordance with Design Table 1 - Private Open Space.
Water Sensitive Design	
PO 18.1 Residential development creating a common driveway / access includes stormwater management systems that minimise the discharge of sediment, suspended solids, organic matter, nutrients, bacteria, litter and other contaminants to the stormwater system, watercourses or other water bodies.	DTS/DPF 18.1 Residential development creating a common driveway / access that services 5 or more dwellings achieves the following stormwater runoff outcomes: (a) 80 per cent reduction in average annual total suspended solids (b) 60 per cent reduction in average annual total phosphorus (c) 45 per cent reduction in average annual total nitrogen.
PO 18.2 Residential development creating a common driveway / access includes a stormwater management system designed to mitigate peak flows and manage the rate and duration of stormwater discharges from the site to ensure that the development does not increase the peak flows in downstream systems.	DTS/DPF 18.2 Development creating a common driveway / access that services 5 or more dwellings: (a) maintains the pre-development peak flow rate from the site based upon a 0.35 runoff coefficient for the 18.1% AEP 30-minute storm and the stormwater runoff time to peak is not increased or captures and retains the difference in pre-development runoff volume (based upon a 0.35 runoff coefficient) vs post development runoff volume from the site for an 18.1% AEP 30-minute storm; and (b) manages site generated stormwater runoff up to and including the 1% AEP flood event to avoid flooding of buildings.
Car parking, access and manoeuvrability	
PO 19.1 Enclosed parking spaces are of a size and dimensions to be functional, accessible and convenient.	DTS/DPF 19.1 Residential car parking spaces enclosed by fencing, walls or other structures have the following internal dimensions (separate from any waste storage area): (a) single width car parking spaces: (i) a minimum length of 5.4m per space (ii) a minimum width of 3.0m (iii) a minimum garage door width of 2.4m (b) double width car parking spaces (side by side): (i) a minimum length of 5.4m (ii) a minimum width of 5.4m (iii) minimum garage door width of 2.4m per space.
PO 19.2 Uncovered parking spaces are of a size and dimensions to be functional, accessible and convenient.	DTS/DPF 19.2 Uncovered car parking spaces have: (a) a minimum length of 5.4m (b) a minimum width of 2.4m (c) a minimum width between the centre line of the space and any fence, wall or other obstruction of 1.5m
PO 19.3 Driveways and access points are located and designed to facilitate safe access and egress while maximising land available for street tree planting, pedestrian movement, domestic waste collection, landscaped street frontages and on-street parking.	DTS/DPF 19.3 Driveways and access points on sites with a frontage to a public road of 10m or less have a width between 3.0 and 3.2 metres measured at the property boundary and are the only access point provided on the site.
PO 19.4 Vehicle access is safe, convenient, minimises interruption to the	DTS/DPF 19.4 Vehicle access to designated car parking spaces satisfy (a) or (b):

operation of public roads and does not interfere with street infrastructure or street trees.	(a) is provided via a lawfully existing or authorised access point or an access point for which consent has been granted as part of an application for the division of land (b) where newly proposed: (i) is set back 6m or more from the tangent point of an intersection of 2 or more roads (ii) is set back outside of the marked lines or infrastructure dedicating a pedestrian crossing (iii) does not involve the removal, relocation or damage to of mature street trees, street furniture or utility infrastructure services.
PO 19.5 Driveways are designed to enable safe and convenient vehicle movements from the public road to on-site parking spaces.	DTS/DPF 19.5 Driveways are designed and sited so that: (a) the gradient of the driveway does not exceed a grade of 1 in 4 and includes transitions to ensure a maximum grade change of 12.5% (1 in 8) for summit changes, and 15% (1 in 6.7) for sag changes, in accordance with AS 2890.1:2004 to prevent vehicles bottoming or scraping (b) the centreline of the driveway has an angle of no less than 70 degrees and no more than 110 degrees from the street boundary to which it takes its access as shown in the following diagram:  (c) if located to provide access from an alley, lane or right of way - the alley, land or right or way is at least 6.2m wide along the boundary of the allotment / site
PO 19.6 Driveways and access points are designed and distributed to optimise the provision of on-street visitor parking.	DTS/DPF 19.6 Where on-street parking is available abutting the site's street frontage, on-street parking is retained in accordance with the following requirements: (a) minimum 0.33 on-street spaces per dwelling on the site (rounded up to the nearest whole number) (b) minimum car park length of 5.4m where a vehicle can enter or exit a space directly

	(c) minimum carpark length of 6m for an intermediate space located between two other parking spaces or to an end obstruction where the parking is indented.
Waste storage	
PO 20.1 Provision is made for the adequate and convenient storage of waste bins in a location screened from public view.	DTS/DPF 20.1 None are applicable.
Design of Transportable Dwellings	
PO 21.1 The sub-floor space beneath transportable buildings is enclosed to give the appearance of a permanent structure.	DTS/DPF 21.1 Buildings satisfy (a) or (b): (a) are not transportable or (b) the sub-floor space between the building and ground level is clad in a material and finish consistent with the building.
Group dwelling, residential flat buildings and battle-axe development	
Amenity	
PO 22.1 Dwellings are of a suitable size to accommodate a layout that is well organised and provides a high standard of amenity for occupants.	DTS/DPF 22.1 Dwellings have a minimum internal floor area in accordance with the following table: **Number of bedrooms** / **Minimum internal floor area** Studio / 35m^2 1 bedroom / 50m^2 2 bedroom / 65m^2 3+ bedrooms / 80m^2 and any dwelling over 3 bedrooms provides an additional 15m^2 for every additional bedroom
PO 22.2 The orientation and siting of buildings minimises impacts on the amenity, outlook and privacy of occupants and neighbours.	DTS/DPF 22.2 None are applicable.
PO 22.3 Development maximises the number of dwellings that face public open space and public streets and limits dwellings oriented towards adjoining properties.	DTS/DPF 22.3 None are applicable.
PO 22.4 Battle-axe development is appropriately sited and designed to respond to the existing neighbourhood context.	DTS/DPF 22.4 Dwelling sites/allotments are not in the form of a battle-axe arrangement.
Communal Open Space	
PO 23.1 Private open space provision may be substituted for communal open space which is designed and sited to meet the recreation and amenity needs of residents.	DTS/DPF 23.1 None are applicable.
PO 23.2 Communal open space is of sufficient size and dimensions to cater for group recreation.	DTS/DPF 23.2 Communal open space incorporates a minimum dimension of 5 metres.

PO 23.3 Communal open space is designed and sited to: (a) be conveniently accessed by the dwellings which it services (b) have regard to acoustic, safety, security and wind effects.	DTS/DPF 23.3 None are applicable.
PO 23.4 Communal open space contains landscaping and facilities that are functional, attractive and encourage recreational use.	DTS/DPF 23.4 None are applicable.
PO 23.5 Communal open space is designed and sited to: (a) in relation to rooftop or elevated gardens, minimise overlooking into habitable room windows or onto the useable private open space of other dwellings (b) in relation to ground floor communal space, be overlooked by habitable rooms to facilitate passive surveillance.	DTS/DPF 23.5 None are applicable.
Carparking, access and manoeuvrability	
PO 24.1 Driveways and access points are designed and distributed to optimise the provision of on-street visitor parking.	DTS/DPF 24.1 Where on-street parking is available directly adjacent the site, on-street parking is retained adjacent the subject site in accordance with the following requirements: (a) minimum 0.33 on-street car parks per proposed dwellings (rounded up to the nearest whole number) (b) minimum car park length of 5.4m where a vehicle can enter or exit a space directly (c) minimum carpark length of 6m for an intermediate space located between two other parking spaces or to an end obstruction where the parking is indented.
PO 24.2 The number of vehicular access points onto public roads is minimised to reduce interruption of the footpath and positively contribute to public safety and walkability.	DTS/DPF 24.2 Access to group dwellings or dwellings within a residential flat building is provided via a single common driveway.
PO 24.3 Residential driveways that service more than one dwelling are designed to allow safe and convenient movement.	DTS/DPF 24.3 Driveways that service more than 1 dwelling or a dwelling on a battle-axe site: (a) have a minimum width of 3m (b) for driveways servicing more than 3 dwellings: (i) have a width of 5.5m or more and a length of 6m or more at the kerb of the primary street (ii) where the driveway length exceeds 30m, incorporate a passing point at least every 30 metres with a minimum width of 5.5m and a minimum length of 6m.
PO 24.4 Residential driveways in a battle-axe configuration are designed to allow safe and convenient movement.	DTS/DPF 24.4 Where in a battle-axe configuration, a driveway servicing one dwelling has a minimum width of 3m.
PO 24.5 Residential driveways that service more than one dwelling are designed to allow passenger vehicles to enter and exit the site and manoeuvre within the site in a safe and convenient manner.	DTS/DPF 24.5 Driveways providing access to more than one dwelling, or a dwelling on a battle-axe site, allow a B85 passenger vehicle to enter and exit the garages or parking spaces in no more than a three-point turn manoeuvre.
PO 24.6 Dwellings are adequately separated from common driveways and manoeuvring areas.	DTS/DPF 24.6 Dwelling walls with entry doors or ground level habitable room windows are set back at least 1.5m from any driveway or area designated for the movement and manoeuvring of vehicles.

Soft Landscaping	
PO 25.1 Soft landscaping is provided between dwellings and common driveways to improve the outlook for occupants and appearance of common areas.	DTS/DPF 25.1 Other than where located directly in front of a garage or a building entry, soft landscaping with a minimum dimension of 1m is provided between a dwelling and common driveway.
PO 25.2 Soft landscaping is provided that improves the appearance of common driveways.	DTS/DPF 25.2 Where a common driveway is located directly adjacent the side or rear boundary of the site, soft landscaping with a minimum dimension of 1m is provided between the driveway and site boundary (excluding along the perimeter of a passing point).
Site Facilities / Waste Storage	
PO 26.1 Provision is made for suitable mailbox facilities close to the major pedestrian entry to the site or conveniently located considering the nature of accommodation and mobility of occupants.	DTS/DPF 26.1 None are applicable.
PO 26.2 Provision is made for suitable external clothes drying facilities.	DTS/DPF 26.2 None are applicable.
PO 26.3 Provision is made for suitable household waste and recyclable material storage facilities which are: (a) located away, or screened, from public view, and (b) conveniently located in proximity to dwellings and the waste collection point.	DTS/DPF 26.3 None are applicable.
PO 26.4 Waste and recyclable material storage areas are located away from dwellings.	DTS/DPF 26.4 Dedicated waste and recyclable material storage areas are located at least 3m from any habitable room window.
PO 26.5 Where waste bins cannot be conveniently collected from the street, provision is made for on-site waste collection, designed to accommodate the safe and convenient access, egress and movement of waste collection vehicles.	DTS/DPF 26.5 None are applicable.
PO 26.6 Services including gas and water meters are conveniently located and screened from public view.	DTS/DPF 26.6 None are applicable.
Supported accommodation and retirement facilities	
Siting and Configuration	
PO 27.1 Supported accommodation and housing for aged persons and people with disabilities is located where on-site movement of residents is not unduly restricted by the slope of the land.	DTS/DPF 27.1 None are applicable.
Movement and Access	
PO 28.1 Development is designed to support safe and convenient access and movement for residents by providing: (a) ground-level access or lifted access to all units (b) level entry porches, ramps, paths, driveways, passenger loading areas and areas adjacent to footpaths that allow for the passing of wheelchairs and resting places	DTS/DPF 28.1 None are applicable.

(c) car parks with gradients no steeper than 1-in-40 and of sufficient area to provide for wheelchair manoeuvrability (d) kerb ramps at pedestrian crossing points.	
Communal Open Space	
PO 29.1 Development is designed to provide attractive, convenient and comfortable indoor and outdoor communal areas to be used by residents and visitors.	DTS/DPF 29.1 None are applicable.
PO 29.2 Private open space provision may be substituted for communal open space which is designed and sited to meet the recreation and amenity needs of residents.	DTS/DPF 29.2 None are applicable.
PO 29.3 Communal open space is of sufficient size and dimensions to cater for group recreation.	DTS/DPF 29.3 Communal open space incorporates a minimum dimension of 5 metres.
PO 29.4 Communal open space is designed and sited to: (a) be conveniently accessed by the dwellings which it services (b) have regard to acoustic, safety, security and wind effects.	DTS/DPF 29.4 None are applicable.
PO 29.5 Communal open space contains landscaping and facilities that are functional, attractive and encourage recreational use.	DTS/DPF 29.5 None are applicable.
PO 29.6 Communal open space is designed and sited to: (a) in relation to rooftop or elevated gardens, minimise overlooking into habitable room windows or onto the useable private open space of other dwellings (b) in relation to ground floor communal space, be overlooked by habitable rooms to facilitate passive surveillance.	DTS/DPF 29.6 None are applicable.
Site Facilities / Waste Storage	
PO 30.1 Development is designed to provide storage areas for personal items and specialised equipment such as small electric powered vehicles, including facilities for the recharging of small electric powered vehicles.	DTS/DPF 30.1 None are applicable.
PO 30.2 Provision is made for suitable mailbox facilities close to the major pedestrian entry to the site or conveniently located considering the nature of accommodation and mobility of occupants.	DTS/DPF 30.2 None are applicable.
PO 30.3 Provision is made for suitable external clothes drying facilities.	DTS/DPF 30.3 None are applicable.
PO 30.4 Provision is made for suitable household waste and recyclable material storage facilities conveniently located and screened from public view.	DTS/DPF 30.4 None are applicable.
PO 30.5 Waste and recyclable material storage areas are located away from dwellings.	DTS/DPF 30.5 Dedicated waste and recyclable material storage areas are located at least 3m from any habitable room window.
PO 30.6	DTS/DPF 30.6

Provision is made for on-site waste collection where 10 or more bins are to be collected at any one time.	None are applicable.
PO 30.7 Services including gas and water meters are conveniently located and screened from public view.	DTS/DPF 30.7 None are applicable.
All non-residential development	
Water Sensitive Design	
PO 31.1 Development likely to result in significant risk of export of litter, oil or grease includes stormwater management systems designed to minimise pollutants entering stormwater.	DTS/DPF 31.1 None are applicable.
PO 31.2 Water discharged from a development site is of a physical, chemical and biological condition equivalent to or better than its pre-developed state.	DTS/DPF 31.2 None are applicable.
Wash-down and Waste Loading and Unloading	
PO 32.1 Areas for activities including loading and unloading, storage of waste refuse bins in commercial and industrial development or wash-down areas used for the cleaning of vehicles, vessels, plant or equipment are: (a) designed to contain all wastewater likely to pollute stormwater within a bunded and roofed area to exclude the entry of external surface stormwater run-off (b) paved with an impervious material to facilitate wastewater collection (c) of sufficient size to prevent 'splash-out' or 'over-spray' of wastewater from the wash-down area (d) designed to drain wastewater to either: (i) a treatment device such as a sediment trap and coalescing plate oil separator with subsequent disposal to a sewer, private or Community Wastewater Management Scheme or (ii) a holding tank and its subsequent removal off-site on a regular basis.	DTS/DPF 32.1 None are applicable.
Decks	
Design and Siting	
PO 33.1 Decks are designed and sited to: (a) complement the associated building form (b) minimise impacts on the streetscape through siting behind the building line of the principal building (unless on a significant allotment or open space) (c) minimise cut and fill and overall massing when viewed from adjacent land.	DTS/DPF 33.1 Decks: (a) where ancillary to a dwelling: (i) are not constructed, added to or altered so that any part is situated: A. in front of any part of the building line of the dwelling to which it is ancillary or B. within 900mm of a boundary of the allotment with a secondary street (if the land has boundaries on two or more roads) (ii) are set back at least 900mm from side or rear allotment boundaries (iii) when attached to the dwelling, has a finished floor level consistent with the finished ground floor level of the dwelling

	(iv) where associated with a residential use, retains a total area of soft landscaping for the entire development site, including any common property, with a minimum dimension of 700mm in accordance with (A) or (B), whichever is less: A. a total area is determined by the following table: <table><tr><th>Site area (or in the case of residential flat building or group dwelling(s), average site area) (m^2)</th><th>Minimum percentage of site</th></tr><tr><td><150</td><td>10%</td></tr><tr><td>150-200</td><td>15%</td></tr><tr><td>>200-450</td><td>20%</td></tr><tr><td>>450</td><td>25%</td></tr></table>B. the amount of existing soft landscaping prior to the development occurring. (b) where in association with a non-residential use: (i) are set back at least 2 metres from the boundary of an allotment used for residential purposes. (ii) are set back at least 2 metres from a public road. (iii) have a floor area not exceeding $25m^2$ (c) in all cases, has a finished floor level not exceeding 1 metre above natural ground level at any point.
PO 33.2 Decks are designed and sited to minimise direct overlooking of habitable rooms and private open spaces of adjoining residential uses in neighbourhood-type zones through suitable floor levels, screening and siting taking into account the slope of the subject land, existing vegetation on the subject land, and fencing.	DTS/DPF 33.2 Decks with a finished floor level/s 500mm or more above natural ground level facing side or rear boundaries shared with a residential use in a neighbourhood-type zone incorporate screening with a maximum of 25% transparency/openings, permanently fixed to the outer edge of the deck not less than 1.5 m above the finished floor level/s.
PO 33.3 Decks used for outdoor dining, entertainment or other commercial uses provide carparking in accordance with the primary use of the deck.	DTS/DPF 33.3 Decks used for commercial purposes do not result in less on-site car parking for the primary use of the subject land than specified in Transport, Access and Parking Table 1 - General Off-Street Car Parking Requirements or Table 2 - Off-Street Car Parking Requirements in Designated Areas.

Table 1 - Private Open Space

Dwelling Type	Minimum Rate
Dwelling (at ground level)	Total private open space area: (a) Site area <$301m^2$: $24m^2$ located behind the building line. (b) Site area ≥ $301m^2$: $60m^2$ located behind the building line. Minimum directly accessible from a living room: $16m^2$ / with a minimum dimension 3m.
Dwelling (above ground level)	Studio (no separate bedroom): $4m^2$ with a minimum dimension 1.8m One bedroom: $8m^2$ with a minimum dimension 2.1m

	Two bedroom dwelling: 11m^2 with a minimum dimension 2.4m Three + bedroom dwelling: 15m^2 with a minimum dimension 2.6m
Cabin or caravan (permanently fixed to the ground) in a residential park or a caravan and tourist park	Total area: 16m^2, which may be used as second car parking space, provided on each site intended for residential occupation.

Design in Urban Areas

Assessment Provisions (AP)

Desired Outcome (DO)

Desired Outcome	
DO 1	Development is: (a) contextual - by considering, recognising and carefully responding to its natural surroundings or built environment and positively contributing to the character of the locality (b) durable - fit for purpose, adaptable and long lasting (c) inclusive - by integrating landscape design to optimise pedestrian and cyclist usability, privacy and equitable access and promoting the provision of quality spaces integrated with the public realm that can be used for access and recreation and help optimise security and safety both internally and within the public realm, for occupants and visitors (d) sustainable - by integrating sustainable techniques into the design and siting of development and landscaping to improve community health, urban heat, water management, environmental performance, biodiversity and local amenity and to minimise energy consumption.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
All Development	
External Appearance	
PO 1.1 Buildings reinforce corners through changes in setback, articulation, materials, colour and massing (including height, width, bulk, roof form and slope).	DTS/DPF 1.1 None are applicable.
PO 1.2 Where zero or minor setbacks are desirable, development provides shelter over footpaths (in the form of verandahs, awnings, canopies and the like, with adequate lighting) to positively contribute to the walkability, comfort and safety of the public realm.	DTS/DPF 1.2 None are applicable.
PO 1.3 Building elevations facing the primary street (other than ancillary buildings) are designed and detailed to convey purpose, identify main access points and complement the streetscape.	DTS/DPF 1.3 None are applicable.
PO 1.4 Plant, exhaust and intake vents and other technical equipment are integrated into the building design to minimise visibility from the public realm and negative impacts on residential amenity by:	DTS/DPF 1.4 Development does not incorporate any structures that protrude beyond the roofline.

(a) positioning plant and equipment discretely, in unobtrusive locations as viewed from public roads and spaces (b) screening rooftop plant and equipment from view (c) when located on the roof of non-residential development, locating the plant and equipment as far as practicable from adjacent sensitive land uses.	
PO 1.5 The negative visual impact of outdoor storage, waste management, loading and service areas is minimised by integrating them into the building design and screening them from public view (such as fencing, landscaping and built form), taking into account the form of development contemplated in the relevant zone.	DTS/DPF 1.5 None are applicable.
Safety	
PO 2.1 Development maximises opportunities for passive surveillance of the public realm by providing clear lines of sight, appropriate lighting and the use of visually permeable screening wherever practicable.	DTS/DPF 2.1 None are applicable.
PO 2.2 Development is designed to differentiate public, communal and private areas.	DTS/DPF 2.2 None are applicable.
PO 2.3 Buildings are designed with safe, perceptible and direct access from public street frontages and vehicle parking areas.	DTS/DPF 2.3 None are applicable.
PO 2.4 Development at street level is designed to maximise opportunities for passive surveillance of the adjacent public realm.	DTS/DPF 2.4 None are applicable.
PO 2.5 Common areas and entry points of buildings (such as the foyer areas of residential buildings) and non-residential land uses at street level, maximise passive surveillance from the public realm to the inside of the building at night.	DTS/DPF 2.5 None are applicable.
Landscaping	
PO 3.1 Soft landscaping and tree planting are incorporated to: (a) minimise heat absorption and reflection (b) maximise shade and shelter (c) maximise stormwater infiltration (d) enhance the appearance of land and streetscapes.	DTS/DPF 3.1 None are applicable.
Environmental Performance	
PO 4.1 Buildings are sited, oriented and designed to maximise natural sunlight access and ventilation to main activity areas, habitable rooms, common areas and open spaces.	DTS/DPF 4.1 None are applicable.
PO 4.2 Buildings are sited and designed to maximise passive environmental performance and minimise energy consumption and reliance on mechanical systems, such as heating and cooling.	DTS/DPF 4.2 None are applicable.
PO 4.3 Buildings incorporate climate responsive techniques and features such as building and window orientation, use of eaves, verandahs and	DTS/DPF 4.3 None are applicable.

shading structures, water harvesting, at ground landscaping, green walls, green roofs and photovoltaic cells.	
Water Sensitive Design	
PO 5.1 Development is sited and designed to maintain natural hydrological systems without negatively impacting: (a) the quantity and quality of surface water and groundwater (b) the depth and directional flow of surface water and groundwater (c) the quality and function of natural springs.	DTS/DPF 5.1 None are applicable.
On-site Waste Treatment Systems	
PO 6.1 Dedicated on-site effluent disposal areas do not include any areas to be used for, or could be reasonably foreseen to be used for, private open space, driveways or car parking.	DTS/DPF 6.1 Effluent disposal drainage areas do not: (a) encroach within an area used as private open space or result in less private open space than that specified in Design in Urban Areas Table 1 - Private Open Space (b) use an area also used as a driveway (c) encroach within an area used for on-site car parking or result in less on-site car parking than that specified in Transport, Access and Parking Table 1 - General Off-Street Car Parking Requirements or Table 2 - Off-Street Car Parking Requirements in Designated Areas.
Car parking appearance	
PO 7.1 Development facing the street is designed to minimise the negative impacts of any semi-basement and undercroft car parking on streetscapes through techniques such as: (a) limiting protrusion above finished ground level (b) screening through appropriate planting, fencing and mounding (c) limiting the width of openings and integrating them into the building structure.	DTS/DPF 7.1 None are applicable.
PO 7.2 Vehicle parking areas appropriately located, designed and constructed to minimise impacts on adjacent sensitive receivers through measures such as ensuring they are attractively developed and landscaped, screen fenced and the like.	DTS/DPF 7.2 None are applicable.
PO 7.3 Safe, legible, direct and accessible pedestrian connections are provided between parking areas and the development.	DTS/DPF 7.3 None are applicable.
PO 7.4 Street-level vehicle parking areas incorporate tree planting to provide shade, reduce solar heat absorption and reflection.	DTS/DPF 7.4 Vehicle parking areas that are open to the sky and comprise 10 or more car parking spaces include a shade tree with a mature canopy of 4m diameter spaced for each 10 car parking spaces provided and a landscaped strip on any road frontage of a minimum dimension of 1m.
PO 7.5 Street level parking areas incorporate soft landscaping to improve visual appearance when viewed from within the site and from public places.	DTS/DPF 7.5 Vehicle parking areas comprising 10 or more car parking spaces include soft landscaping with a minimum dimension of: (a) 1m along all public road frontages and allotment boundaries (b) 1m between double rows of car parking spaces.
PO 7.6 Vehicle parking areas and associated driveways are landscaped to provide shade and positively contribute to amenity.	DTS/DPF 7.6 None are applicable.

PO 7.7 Vehicle parking areas and access ways incorporate integrated stormwater management techniques such as permeable or porous surfaces, infiltration systems, drainage swales or rain gardens that integrate with soft landscaping.	DTS/DPF 7.7 None are applicable.
Earthworks and sloping land	
PO 8.1 Development, including any associated driveways and access tracks, minimises the need for earthworks to limit disturbance to natural topography.	DTS/DPF 8.1 Development does not involve any of the following: (a) excavation exceeding a vertical height of 1m (b) filling exceeding a vertical height of 1m (c) a total combined excavation and filling vertical height of 2m or more.
PO 8.2 Driveways and access tracks designed and constructed to allow safe and convenient access on sloping land.	DTS/DPF 8.2 Driveways and access tracks on sloping land (with a gradient exceeding 1 in 8) satisfy (a) and (b): (a) do not have a gradient exceeding 25% (1-in-4) at any point along the driveway (b) are constructed with an all-weather trafficable surface.
PO 8.3 Driveways and access tracks on sloping land (with a gradient exceeding 1 in 8): (a) do not contribute to the instability of embankments and cuttings (b) provide level transition areas for the safe movement of people and goods to and from the development (c) are designed to integrate with the natural topography of the land.	DTS/DPF 8.3 None are applicable.
PO 8.4 Development on sloping land (with a gradient exceeding 1 in 8) avoids the alteration of natural drainage lines and includes on site drainage systems to minimise erosion.	DTS/DPF 8.4 None are applicable.
PO 8.5 Development does not occur on land at risk of landslip or increase the potential for landslip or land surface instability.	DTS/DPF 8.5 None are applicable.
Fences and walls	
PO 9.1 Fences, walls and retaining walls of sufficient height maintain privacy and security without unreasonably impacting visual amenity and adjoining land's access to sunlight or the amenity of public places.	DTS/DPF 9.1 None are applicable.
PO 9.2 Landscaping is incorporated on the low side of retaining walls that are visible from public roads and public open space to minimise visual impacts.	DTS/DPF 9.2 A vegetated landscaped strip 1m wide or more is provided against the low side of a retaining wall.
Overlooking / Visual Privacy (low rise buildings)	
PO 10.1 Development mitigates direct overlooking from upper level windows to habitable rooms and private open spaces of adjoining residential uses in neighbourhood-type zones.	DTS/DPF 10.1 Upper level windows facing side or rear boundaries shared with a residential use in a neighbourhood-type zone: (a) are permanently obscured to a height of 1.5m above finished floor level and are fixed or not capable of being opened more than 125mm

	(b) have sill heights greater than or equal to 1.5m above finished floor level (c) incorporate screening with a maximum of 25% openings, permanently fixed no more than 500mm from the window surface and sited adjacent to any part of the window less than 1.5 m above the finished floor level.
PO 10.2 Development mitigates direct overlooking from balconies to habitable rooms and private open space of adjoining residential uses in neighbourhood type zones.	DTS/DPF 10.2 One of the following is satisfied: (a) the longest side of the balcony or terrace will face a public road, public road reserve or public reserve that is at least 15m wide in all places faced by the balcony or terrace or (b) all sides of balconies or terraces on upper building levels are permanently obscured by screening with a maximum 25% transparency/openings fixed to a minimum height of: (i) 1.5m above finished floor level where the balcony is located at least 15 metres from the nearest habitable window of a dwelling on adjacent land or (ii) 1.7m above finished floor level in all other cases
Site Facilities / Waste Storage (excluding low rise residential development)	
PO 11.1 Development provides a dedicated area for on-site collection and sorting of recyclable materials and refuse, green organic waste and wash bay facilities for the ongoing maintenance of bins that is adequate in size considering the number and nature of the activities they will serve and the frequency of collection.	DTS/DPF 11.1 None are applicable.
PO 11.2 Communal waste storage and collection areas are located, enclosed and designed to be screened from view from the public domain, open space and dwellings.	DTS/DPF 11.2 None are applicable.
PO 11.3 Communal waste storage and collection areas are designed to be well ventilated and located away from habitable rooms.	DTS/DPF 11.3 None are applicable.
PO 11.4 Communal waste storage and collection areas are designed to allow waste and recycling collection vehicles to enter and leave the site without reversing.	DTS/DPF 11.4 None are applicable.
PO 11.5 For mixed use developments, non-residential waste and recycling storage areas and access provide opportunities for on-site management of food waste through composting or other waste recovery as appropriate.	DTS/DPF 11.5 None are applicable.
All Development - Medium and High Rise	
External Appearance	
PO 12.1 Buildings positively contribute to the character of the local area by responding to local context.	DTS/DPF 12.1 None are applicable.
PO 12.2 Architectural detail at street level and a mixture of materials at lower building levels near the public interface are provided to reinforce a human scale.	DTS/DPF 12.2 None are applicable.
PO 12.3 Buildings are designed to reduce visual mass by breaking up building elevations into distinct elements.	DTS/DPF 12.3 None are applicable.
PO 12.4 Boundary walls visible from public land include visually interesting treatments to break up large blank elevations.	DTS/DPF 12.4 None are applicable.

PO 12.5 External materials and finishes are durable and age well to minimise ongoing maintenance requirements.	DTS/DPF 12.5 Buildings utilise a combination of the following external materials and finishes: (a) masonry (b) natural stone (c) pre-finished materials that minimise staining, discolouring or deterioration.
PO 12.6 Street-facing building elevations are designed to provide attractive, high quality and pedestrian-friendly street frontages.	DTS/DPF 12.6 Building street frontages incorporate: (a) active uses such as shops or offices (b) prominent entry areas for multi-storey buildings (where it is a common entry) (c) habitable rooms of dwellings (d) areas of communal public realm with public art or the like, where consistent with the zone and/or subzone provisions.
PO 12.7 Entrances to multi-storey buildings are safe, attractive, welcoming, functional and contribute to streetscape character.	DTS/DPF 12.7 Entrances to multi-storey buildings are: (a) oriented towards the street (b) clearly visible and easily identifiable from the street and vehicle parking areas (c) designed to be prominent, accentuated and a welcoming feature if there are no active or occupied ground floor uses (d) designed to provide shelter, a sense of personal address and transitional space around the entry (e) located as close as practicable to the lift and / or lobby access to minimise the need for long access corridors (f) designed to avoid the creation of potential areas of entrapment.
PO 12.8 Building services, plant and mechanical equipment are screened from the public realm.	DTS/DPF 12.8 None are applicable.
Landscaping	
PO 13.1 Development facing a street provides a well landscaped area that contains a deep soil space to accommodate a tree of a species and size adequate to provide shade, contribute to tree canopy targets and soften the appearance of buildings.	DTS/DPF 13.1 Buildings provide a 4m by 4m deep soil space in front of the building that accommodates a medium to large tree, except where no building setback from front property boundaries is desired.
PO 13.2 Deep soil zones are provided to retain existing vegetation or provide areas that can accommodate new deep root vegetation, including tall trees with large canopies to provide shade and soften the appearance of multi-storey buildings.	DTS/DPF 13.2 Multi-storey development provides deep soil zones and incorporates trees at not less than the following rates, except in a location or zone where full site coverage is desired.

Site area	Minimum deep soil area	Minimum dimension	Tree / deep soil zones
<300 m^2	10 m^2	1.5m	1 small tree / 10 m^2
300-1500 m^2	7% site area	3m	1 medium tree / 30 m^2
>1500 m^2	7% site area	6m	1 large or medium tree / 60 m^2

	Tree size and site area definitions Small tree: 4-6m mature height and 2-4m canopy spread Medium tree: 6-12m mature height and 4-8m canopy spread Large tree: 12m mature height and >8m canopy spread Site area: The total area for development site, not average area per dwelling
PO 13.3 Deep soil zones with access to natural light are provided to assist in maintaining vegetation health.	DTS/DPF 13.3 None are applicable.
PO 13.4 Unless separated by a public road or reserve, development sites adjacent to any zone that has a primary purpose of accommodating low-rise residential development incorporate a deep soil zone along the common boundary to enable medium to large trees to be retained or established to assist in screening new buildings of 3 or more building levels in height.	DTS/DPF 13.4 Building elements of 3 or more building levels in height are set back at least 6m from a zone boundary in which a deep soil zone area is incorporated.
Environmental	
PO 14.1 Development minimises detrimental micro-climatic impacts on adjacent land and buildings.	DTS/DPF 14.1 None are applicable.
PO 14.2 Development incorporates sustainable design techniques and features such as window orientation, eaves and shading structures, water harvesting and use, green walls and roof designs that enable the provision of rain water tanks (where they are not provided elsewhere on site), green roofs and photovoltaic cells.	DTS/DPF 14.2 None are applicable.
PO 14.3 Development of 5 or more building levels, or 21m or more in height (as measured from natural ground level and excluding roof-mounted mechanical plant and equipment) is designed to minimise the impacts of wind through measures such as: (a) a podium at the base of a tall tower and aligned with the street to deflect wind away from the street (b) substantial verandahs around a building to deflect downward travelling wind flows over pedestrian areas (c) the placement of buildings and use of setbacks to deflect the wind at ground level (d) avoiding tall shear elevations that create windy conditions at street level.	DTS/DPF 14.3 None are applicable.
Car Parking	
PO 15.1 Multi-level vehicle parking structures are designed to contribute to active street frontages and complement neighbouring buildings.	DTS/DPF 15.1 Multi-level vehicle parking structures within buildings: (a) provide land uses such as commercial, retail or other non-car parking uses along ground floor street frontages (b) incorporate facade treatments in building elevations facing along major street frontages that are sufficiently enclosed and detailed to complement adjacent buildings.
PO 15.2 Multi-level vehicle parking structures within buildings complement the surrounding built form in terms of height, massing and scale.	DTS/DPF 15.2 None are applicable.

Overlooking/Visual Privacy	
PO 16.1 Development mitigates direct overlooking of habitable rooms and private open spaces of adjacent residential uses in neighbourhood-type zones through measures such as: (a) appropriate site layout and building orientation (b) off-setting the location of balconies and windows of habitable rooms or areas with those of other buildings so that views are oblique rather than direct to avoid direct line of sight (c) building setbacks from boundaries (including building boundary to boundary where appropriate) that interrupt views or that provide a spatial separation between balconies or windows of habitable rooms (d) screening devices that are integrated into the building design and have minimal negative effect on residents' or neighbours' amenity.	DTS/DPF 16.1 None are applicable.
All residential development	
Front elevations and passive surveillance	
PO 17.1 Dwellings incorporate windows facing primary street frontages to encourage passive surveillance and make a positive contribution to the streetscape.	DTS/DPF 17.1 Each dwelling with a frontage to a public street: (a) includes at least one window facing the primary street from a habitable room that has a minimum internal room dimension of 2.4m (b) has an aggregate window area of at least $2m^2$ facing the primary street.
PO 17.2 Dwellings incorporate entry doors within street frontages to address the street and provide a legible entry point for visitors.	DTS/DPF 17.2 Dwellings with a frontage to a public street have an entry door visible from the primary street boundary.
Outlook and Amenity	
PO 18.1 Living rooms have an external outlook to provide a high standard of amenity for occupants.	DTS/DPF 18.1 A living room of a dwelling incorporates a window with an external outlook of the street frontage, private open space, public open space, or waterfront areas.
PO 18.2 Bedrooms are separated or shielded from active communal recreation areas, common access areas and vehicle parking areas and access ways to mitigate noise and artificial light intrusion.	DTS/DPF 18.2 None are applicable.
Ancillary Development	
PO 19.1 Residential ancillary buildings are sited and designed to not detract from the streetscape or appearance of primary residential buildings on the site or neighbouring properties.	DTS/DPF 19.1 Ancillary buildings: (a) are ancillary to a dwelling erected on the same site (b) have a floor area not exceeding 60m2 (c) are not constructed, added to or altered so that any part is situated: (i) in front of any part of the building line of the dwelling to which it is ancillary or (ii) within 900mm of a boundary of the allotment with a secondary street (if the land has boundaries on two or more roads) (d) in the case of a garage or carport, the garage or carport: (i) is set back at least 5.5m from the boundary of the primary street

(ii) when facing a primary street or secondary street, has a total door / opening not exceeding:

A. for dwellings of single building level - 7m in width or 50% of the site frontage, whichever is the lesser

B. for dwellings comprising two or more building levels at the building line fronting the same public street - 7m in width

(e) if situated on a boundary (not being a boundary with a primary street or secondary street), do not exceed a length of 11.5m unless:

(i) a longer wall or structure exists on the adjacent site and is situated on the same allotment boundary and

(ii) the proposed wall or structure will be built along the same length of boundary as the existing adjacent wall or structure to the same or lesser extent

(f) if situated on a boundary of the allotment (not being a boundary with a primary street or secondary street), all walls or structures on the boundary will not exceed 45% of the length of that boundary

(g) will not be located within 3m of any other wall along the same boundary unless on an adjacent site on that boundary there is an existing wall of a building that would be adjacent to or about the proposed wall or structure

(h) have a wall height or post height not exceeding 3m above natural ground level (and not including a gable end)

(i) have a roof height where no part of the roof is more than 5m above the natural ground level

(j) if clad in sheet metal, is pre-colour treated or painted in a non-reflective colour

(k) retains a total area of soft landscaping in accordance with (i) or (ii), whichever is less:

(i) a total area as determined by the following table:

Dwelling site area (or in the case of residential flat building or group dwelling(s), average site area) (m^2)	Minimum percentage of site
<150	10%
150-200	15%
201-450	20%
>450	25%

(ii) the amount of existing soft landscaping prior to the development occurring.

(l) in relation to ancillary accommodation in the Rural Zone, Productive Rural Landscape Zone, or Rural Horticulture Zone, is located within 20m of an existing dwelling.

PO 19.2

Ancillary buildings and structures do not impede on-site functional requirements such as private open space provision, car parking requirements or result in over-development of the site.

DTS/DPF 19.2

Ancillary buildings and structures do not result in:

(a) less private open space than specified in Design in Urban Areas Table 1 - Private Open Space

(b) less on-site car parking than specified in Transport, Access and Parking Table 1 - General Off-Street Car Parking Requirements or Table 2 - Off-Street Car Parking Requirements in Designated Areas.

PO 19.3

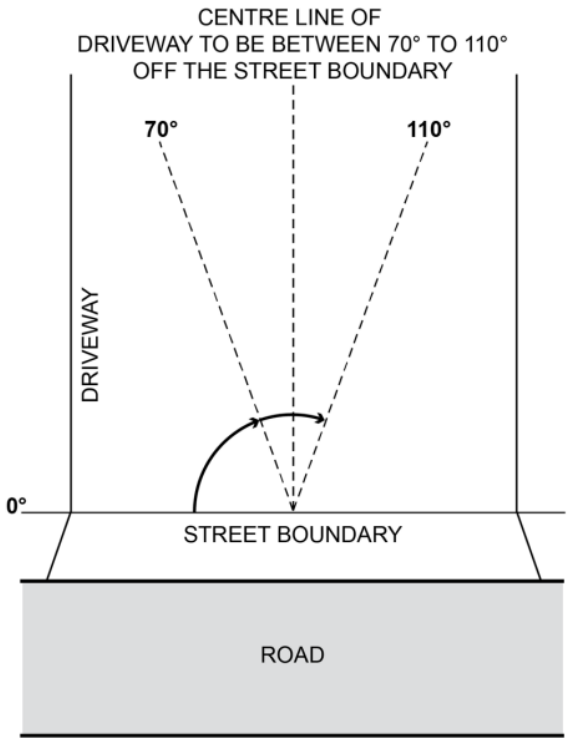
DTS/DPF 19.3

Fixed plant and equipment in the form of pumps and/or filtration systems for a swimming pool or spa positioned and/or housed to not cause unreasonable noise nuisance to adjacent sensitive receivers.	The pump and/or filtration system is ancillary to a dwelling erected on the same site and is: (a) enclosed in a solid acoustic structure that is located at least 5m from the nearest habitable room located on an adjoining allotment or (b) located at least 12m from the nearest habitable room located on an adjoining allotment.
PO 19.4 Buildings and structures that are ancillary to an existing non-residential use do not detract from the streetscape character, appearance of buildings on the site of the development, or the amenity of neighbouring properties.	DTS/DPF 19.4 Non-residential ancillary buildings and structures: (a) are ancillary and subordinate to an existing non-residential use on the same site (b) have a floor area not exceeding the following: Allotment size: ≤500m2 — Floor area: 60m2; >500m2 — 80m2 (c) are not constructed, added to or altered so that any part is situated: (i) in front of any part of the building line of the main building to which it is ancillary or (ii) within 900mm of a boundary of the allotment with a secondary street (if the land has boundaries on two or more roads) (d) in the case of a garage or carport, the garage or carport: (i) is set back at least 5.5m from the boundary of the primary street (e) if situated on a boundary (not being a boundary with a primary street or secondary street), do not exceed a length of 11.5m unless: (i) a longer wall or structure exists on the adjacent site and is situated on the same allotment boundary (ii) the proposed wall or structure will be built along the same length of boundary as the existing adjacent wall or structure to the same or lesser extent (f) if situated on a boundary of the allotment (not being a boundary with a primary street or secondary street), all walls or structures on the boundary will not exceed 45% of the length of that boundary (g) will not be located within 3m of any other wall along the same boundary unless on an adjacent site on that boundary there is an existing wall of a building that would be adjacent to or about the proposed wall or structure (h) have a wall height (or post height) not exceeding 3m (and not including a gable end) (i) have a roof height where no part of the roof is more than 5m above the natural ground level (j) if clad in sheet metal, is pre-colour treated or painted in a non-reflective colour.
Residential Development - Low Rise	
External appearance	
PO 20.1 Garaging is designed to not detract from the streetscape or appearance of a dwelling.	DTS/DPF 20.1 Garages and carports facing a street: (a) are situated so that no part of the garage or carport will be in front of any part of the building line of the dwelling (b) are set back at least 5.5m from the boundary of the primary street (c) have a garage door / opening width not exceeding 7m

	(d) have a garage door / opening width not exceeding 50% of the site frontage unless the dwelling has two or more building levels at the building line fronting the same public street.
PO 20.2 Dwelling elevations facing public streets and common driveways make a positive contribution to the streetscape and the appearance of common driveway areas.	DTS/DPF 20.2 Each dwelling includes at least 3 of the following design features within the building elevation facing a primary street, and at least 2 of the following design features within the building elevation facing any other public road (other than a laneway) or a common driveway: (a) a minimum of 30% of the building wall is set back an additional 300mm from the building line (b) a porch or portico projects at least 1m from the building wall (c) a balcony projects from the building wall (d) a verandah projects at least 1m from the building wall (e) eaves of a minimum 400mm width extend along the width of the front elevation (f) a minimum 30% of the width of the upper level projects forward from the lower level primary building line by at least 300mm (g) a minimum of two different materials or finishes are incorporated on the walls of the front building elevation, with a maximum of 80% of the building elevation in a single material or finish.
PO 20.3 The visual mass of larger buildings is reduced when viewed from adjoining allotments or public streets.	DTS/DPF 20.3 None are applicable
Private Open Space	
PO 21.1 Dwellings are provided with suitable sized areas of usable private open space to meet the needs of occupants.	DTS/DPF 21.1 Private open space is provided in accordance with Design in Urban Areas Table 1 - Private Open Space.
PO 21.2 Private open space is positioned to provide convenient access from internal living areas.	DTS/DPF 21.2 Private open space is directly accessible from a habitable room.
Landscaping	
PO 22.1 Soft landscaping is incorporated into development to: (a) minimise heat absorption and reflection (b) contribute shade and shelter (c) provide for stormwater infiltration and biodiversity (d) enhance the appearance of land and streetscapes.	DTS/DPF 22.1 Residential development incorporates soft landscaping with a minimum dimension of 700mm provided in accordance with (a) and (b): (a) a total area for the entire development site, including any common property, as determined by the following table:

Site area (or in the case of residential flat building or group dwelling(s), average site area) (m^2)	Minimum percentage of site
<150	10%
150-200	15%
>200-450	20%
>450	25%

	(b) at least 30% of any land between the primary street boundary and the primary building line.
Car parking, access and manoeuvrability	
PO 23.1 Enclosed car parking spaces are of dimensions to be functional, accessible and convenient.	DTS/DPF 23.1 Residential car parking spaces enclosed by fencing, walls or other structures have the following internal dimensions (separate from any waste storage area): (a) single width car parking spaces: (i) a minimum length of 5.4m per space (ii) a minimum width of 3.0m (iii) a minimum garage door width of 2.4m (b) double width car parking spaces (side by side): (i) a minimum length of 5.4m (ii) a minimum width of 5.4m (iii) minimum garage door width of 2.4m per space.
PO 23.2 Uncovered car parking space are of dimensions to be functional, accessible and convenient.	DTS/DPF 23.2 Uncovered car parking spaces have: (a) a minimum length of 5.4m (b) a minimum width of 2.4m (c) a minimum width between the centre line of the space and any fence, wall or other obstruction of 1.5m.
PO 23.3 Driveways and access points are located and designed to facilitate safe access and egress while maximising land available for street tree planting, pedestrian movement, domestic waste collection, landscaped street frontages and on-street parking.	DTS/DPF 23.3 Driveways and access points satisfy (a) or (b): (a) sites with a frontage to a public road of 10m or less, have a width between 3.0 and 3.2 metres measured at the property boundary and are the only access point provided on the site (b) sites with a frontage to a public road greater than 10m: (i) have a maximum width of 5m measured at the property boundary and are the only access point provided on the site; (ii) have a width between 3.0 metres and 3.2 metres measured at the property boundary and no more than two access points are provided on site, separated by no less than 1m.
PO 23.4 Vehicle access is safe, convenient, minimises interruption to the operation of public roads and does not interfere with street infrastructure or street trees.	DTS/DPF 23.4 Vehicle access to designated car parking spaces satisfy (a) or (b): (a) is provided via a lawfully existing or authorised access point or an access point for which consent has been granted as part of an application for the division of land (b) where newly proposed, is set back: (i) 0.5m or more from any street furniture, street pole, infrastructure services pit, or other stormwater or utility infrastructure unless consent is provided from the asset owner (ii) 2m or more from the base of the trunk of a street tree unless consent is provided from the tree owner for a lesser distance (iii) 6m or more from the tangent point of an intersection of 2 or more roads (iv) outside of the marked lines or infrastructure dedicating a pedestrian crossing.
PO 23.5	DTS/DPF 23.5

Driveways are designed to enable safe and convenient vehicle movements from the public road to on-site parking spaces.	Driveways are designed and sited so that: (a) the gradient of the driveway does not exceed a grade of 1 in 4 and includes transitions to ensure a maximum grade change of 12.5% (1 in 8) for summit changes, and 15% (1 in 6.7) for sag changes, in accordance with AS 2890.1:2004 to prevent vehicles bottoming or scraping (b) the centreline of the driveway has an angle of no less than 70 degrees and no more than 110 degrees from the street boundary to which it takes its access as shown in the following diagram:  (c) if located to provide access from an alley, lane or right of way - the alley, land or right or way is at least 6.2m wide along the boundary of the allotment / site.
PO 23.6 Driveways and access points are designed and distributed to optimise the provision of on-street visitor parking.	DTS/DPF 23.6 Where on-street parking is available abutting the site's street frontage, on-street parking is retained in accordance with the following requirements: (a) minimum 0.33 on-street spaces per dwelling on the site (rounded up to the nearest whole number) (b) minimum car park length of 5.4m where a vehicle can enter or exit a space directly (c) minimum carpark length of 6m for an intermediate space located between two other parking spaces or to an end obstruction where the parking is indented.
Waste storage	
PO 24.1 Provision is made for the convenient storage of waste bins in a location screened from public view.	DTS/DPF 24.1 Where dwellings abut both side boundaries a waste bin storage area is provided behind the building line of each dwelling that: (a) has a minimum area of $2m^2$ with a minimum dimension of 900mm (separate from any designated car parking spaces or private open space); and (b) has a continuous unobstructed path of travel (excluding moveable objects like gates, vehicles and roller doors) with a minimum width of 800mm between the waste bin storage area and the street.

Design of Transportable Buildings	
PO 25.1 The sub-floor space beneath transportable buildings is enclosed to give the appearance of a permanent structure.	DTS/DPF 25.1 Buildings satisfy (a) or (b): (a) are not transportable (b) the sub-floor space between the building and ground level is clad in a material and finish consistent with the building.
Residential Development - Medium and High Rise (including serviced apartments)	
Outlook and Visual Privacy	
PO 26.1 Ground level dwellings have a satisfactory short range visual outlook to public, communal or private open space.	DTS/DPF 26.1 Buildings: (a) provide a habitable room at ground or first level with a window facing toward the street (b) limit the height / extent of solid walls or fences facing the street to 1.2m high above the footpath level or, where higher, to 50% of the site frontage.
PO 26.2 The visual privacy of ground level dwellings within multi-level buildings is protected.	DTS/DPF 26.2 The finished floor level of ground level dwellings in multi-storey developments is raised by up to 1.2m.
Private Open Space	
PO 27.1 Dwellings are provided with suitable sized areas of usable private open space to meet the needs of occupants.	DTS/DPF 27.1 Private open space provided in accordance with Design in Urban Areas Table 1 - Private Open Space.
Residential amenity in multi-level buildings	
PO 28.1 Residential accommodation within multi-level buildings have habitable rooms, windows and balconies designed and positioned to be separated from those of other dwellings and accommodation to provide visual and acoustic privacy and allow for natural ventilation and the infiltration of daylight into interior and outdoor spaces.	DTS/DPF 28.1 Habitable rooms and balconies of independent dwellings and accommodation are separated by at least 6m from one another where there is a direct line of sight between them and 3m or more from a side or rear property boundary.
PO 28.2 Balconies are designed, positioned and integrated into the overall architectural form and detail of the development to: (a) respond to daylight, wind, and acoustic conditions to maximise comfort and provide visual privacy (b) allow views and casual surveillance of the street while providing for safety and visual privacy of nearby living spaces and private outdoor areas.	DTS/DPF 28.2 Balconies utilise one or a combination of the following design elements: (a) sun screens (b) pergolas (c) louvres (d) green facades (e) openable walls.
PO 28.3 Balconies are of sufficient size and depth to accommodate outdoor seating and promote indoor / outdoor living.	DTS/DPF 28.3 Balconies open directly from a habitable room and incorporate a minimum dimension of 2m.
PO 28.4 Dwellings are provided with sufficient space for storage to meet likely occupant needs.	DTS/DPF 28.4 Dwellings (not including student accommodation or serviced apartments) are provided with storage at the following rates with at least 50% or more of the storage volume to be provided within the dwelling: (a) studio: not less than $6m^3$ (b) 1 bedroom dwelling / apartment: not less than $8m^3$ (c) 2 bedroom dwelling / apartment: not less than $10m^3$ (d) 3+ bedroom dwelling / apartment: not less than $12m^3$.

PO 28.5 Dwellings that use light wells for access to daylight, outlook and ventilation for habitable rooms, are designed to ensure a reasonable living amenity is provided.	DTS/DPF 28.5 Light wells: (a) are not used as the primary source of outlook for living rooms (b) up to 18m in height have a minimum horizontal dimension of 3m, or 6m if overlooked by bedrooms (c) above 18m in height have a minimum horizontal dimension of 6m, or 9m if overlooked by bedrooms.
PO 28.6 Attached or abutting dwellings are designed to minimise the transmission of sound between dwellings and, in particular, to protect bedrooms from possible noise intrusions.	DTS/DPF 28.6 None are applicable.
PO 28.7 Dwellings are designed so that internal structural columns correspond with the position of internal walls to ensure that the space within the dwelling/apartment is useable.	DTS/DPF 28.7 None are applicable.
Dwelling Configuration	
PO 29.1 Buildings containing in excess of 10 dwellings provide a variety of dwelling sizes and a range in the number of bedrooms per dwelling to contribute to housing diversity.	DTS/DPF 29.1 Buildings containing in excess of 10 dwellings provide at least one of each of the following: (a) studio (where there is no separate bedroom) (b) 1 bedroom dwelling / apartment with a floor area of at least $50m^2$ (c) 2 bedroom dwelling / apartment with a floor area of at least $65m^2$ (d) 3+ bedroom dwelling / apartment with a floor area of at least $80m^2$, and any dwelling over 3 bedrooms provides an additional $15m^2$ for every additional bedroom.
PO 29.2 Dwellings located on the ground floor of multi-level buildings with 3 or more bedrooms have the windows of their habitable rooms overlooking internal courtyard space or other public space, where possible.	DTS/DPF 29.2 None are applicable.
Common Areas	
PO 30.1 The size of lifts, lobbies and corridors is sufficient to accommodate movement of bicycles, strollers, mobility aids and visitor waiting areas.	DTS/DPF 30.1 Common corridor or circulation areas: (a) have a minimum ceiling height of 2.7m (b) provide access to no more than 8 dwellings (c) incorporate a wider section at apartment entries where the corridors exceed 12m in length from a core.
Group Dwellings, Residential Flat Buildings and Battle axe Development	
Amenity	
PO 31.1 Dwellings are of a suitable size to provide a high standard of amenity for occupants.	DTS/DPF 31.1 Dwellings have a minimum internal floor area in accordance with the following table:

Number of bedrooms	Minimum internal floor area
Studio	$35m^2$
1 bedroom	$50m^2$
2 bedroom	$65m^2$

	3+ bedrooms	80m^2 and any dwelling over 3 bedrooms provides an additional 15m^2 for every additional bedroom
PO 31.2 The orientation and siting of buildings minimises impacts on the amenity, outlook and privacy of occupants and neighbours.	DTS/DPF 31.2 None are applicable.	
PO 31.3 Development maximises the number of dwellings that face public open space and public streets and limits dwellings oriented towards adjoining properties.	DTS/DPF 31.3 None are applicable.	
PO 31.4 Battle-axe development is appropriately sited and designed to respond to the existing neighbourhood context.	DTS/DPF 31.4 Dwelling sites/allotments are not in the form of a battle-axe arrangement.	
Communal Open Space		
PO 32.1 Private open space provision may be substituted for communal open space which is designed and sited to meet the recreation and amenity needs of residents.	DTS/DPF 32.1 None are applicable.	
PO 32.2 Communal open space is of sufficient size and dimensions to cater for group recreation.	DTS/DPF 32.2 Communal open space incorporates a minimum dimension of 5 metres.	
PO 32.3 Communal open space is designed and sited to: (a) be conveniently accessed by the dwellings which it services (b) have regard to acoustic, safety, security and wind effects.	DTS/DPF 32.3 None are applicable.	
PO 32.4 Communal open space contains landscaping and facilities that are functional, attractive and encourage recreational use.	DTS/DPF 32.4 None are applicable.	
PO 32.5 Communal open space is designed and sited to: (a) in relation to rooftop or elevated gardens, minimise overlooking into habitable room windows or onto the useable private open space of other dwellings (b) in relation to ground floor communal space, be overlooked by habitable rooms to facilitate passive surveillance.	DTS/DPF 32.5 None are applicable.	
Car parking, access and manoeuvrability		
PO 33.1 Driveways and access points are designed and distributed to optimise the provision of on-street visitor parking.	DTS/DPF 33.1 Where on-street parking is available directly adjacent the site, on-street parking is retained adjacent the subject site in accordance with the following requirements: (a) minimum 0.33 on-street car parks per proposed dwelling (rounded up to the nearest whole number) (b) minimum car park length of 5.4m where a vehicle can enter or exit a space directly (c) minimum carpark length of 6m for an intermediate space located between two other parking spaces or to an end obstruction where the parking is indented.	
PO 33.2 The number of vehicular access points onto public roads is minimised to reduce interruption of the footpath and positively contribute to public safety and walkability.	DTS/DPF 33.2 Access to group dwellings or dwellings within a residential flat building is provided via a single common driveway.	

PO 33.3 Residential driveways that service more than one dwelling are designed to allow safe and convenient movement.	DTS/DPF 33.3 Driveways that service more than 1 dwelling or a dwelling on a battle-axe site: (a) have a minimum width of 3m (b) for driveways servicing more than 3 dwellings: (i) have a width of 5.5m or more and a length of 6m or more at the kerb of the primary street (ii) where the driveway length exceeds 30m, incorporate a passing point at least every 30 metres with a minimum width of 5.5m and a minimum length of 6m.
PO 33.4 Residential driveways that service more than one dwelling or a dwelling on a battle-axe site are designed to allow passenger vehicles to enter and exit and manoeuvre within the site in a safe and convenient manner.	DTS/DPF 33.4 Driveways providing access to more than one dwelling, or a dwelling on a battle-axe site, allow a B85 passenger vehicle to enter and exit the garages or parking spaces in no more than a three-point turn manoeuvre.
PO 33.5 Dwellings are adequately separated from common driveways and manoeuvring areas.	DTS/DPF 33.5 Dwelling walls with entry doors or ground level habitable room windows are set back at least 1.5m from any driveway or area designated for the movement and manoeuvring of vehicles.
Soft landscaping	
PO 34.1 Soft landscaping is provided between dwellings and common driveways to improve the outlook for occupants and appearance of common areas.	DTS/DPF 34.1 Other than where located directly in front of a garage or building entry, soft landscaping with a minimum dimension of 1m is provided between a dwelling and common driveway.
PO 34.2 Battle-axe or common driveways incorporate landscaping and permeability to improve appearance and assist in stormwater management.	DTS/DPF 34.2 Battle-axe or common driveways satisfy (a) and (b): (a) are constructed of a minimum of 50% permeable or porous material (b) where the driveway is located directly adjacent the side or rear boundary of the site, soft landscaping with a minimum dimension of 1m is provided between the driveway and site boundary (excluding along the perimeter of a passing point).
Site Facilities / Waste Storage	
PO 35.1 Provision is made for suitable mailbox facilities close to the major pedestrian entry to the site or conveniently located considering the nature of accommodation and mobility of occupants.	DTS/DPF 35.1 None are applicable.
PO 35.2 Provision is made for suitable external clothes drying facilities.	DTS/DPF 35.2 None are applicable.
PO 35.3 Provision is made for suitable household waste and recyclable material storage facilities which are: (a) located away, or screened, from public view, and (b) conveniently located in proximity to dwellings and the waste collection point.	DTS/DPF 35.3 None are applicable.
PO 35.4 Waste and recyclable material storage areas are located away from dwellings.	DTS/DPF 35.4 Dedicated waste and recyclable material storage areas are located at least 3m from any habitable room window.
PO 35.5	DTS/DPF 35.5

Where waste bins cannot be conveniently collected from the street, provision is made for on-site waste collection, designed to accommodate the safe and convenient access, egress and movement of waste collection vehicles.	None are applicable.
PO 35.6 Services including gas and water meters are conveniently located and screened from public view.	DTS/DPF 35.6 None are applicable.
Water sensitive urban design	
PO 36.1 Residential development creating a common driveway / access includes stormwater management systems that minimise the discharge of sediment, suspended solids, organic matter, nutrients, bacteria, litter and other contaminants to the stormwater system, watercourses or other water bodies.	DTS/DPF 36.1 None are applicable.
PO 36.2 Residential development creating a common driveway / access includes a stormwater management system designed to mitigate peak flows and manage the rate and duration of stormwater discharges from the site to ensure that the development does not increase the peak flows in downstream systems.	DTS/DPF 36.2 None are applicable.
Supported Accommodation and retirement facilities	
Siting, Configuration and Design	
PO 37.1 Supported accommodation and housing for aged persons and people with disabilities is located where on-site movement of residents is not unduly restricted by the slope of the land.	DTS/DPF 37.1 None are applicable.
PO 37.2 Universal design features are incorporated to provide options for people living with disabilities or limited mobility and / or to facilitate ageing in place.	DTS/DPF 37.2 None are applicable.
Movement and Access	
PO 38.1 Development is designed to support safe and convenient access and movement for residents by providing: (a) ground-level access or lifted access to all units (b) level entry porches, ramps, paths, driveways, passenger loading areas and areas adjacent to footpaths that allow for the passing of wheelchairs and resting places (c) car parks with gradients no steeper than 1-in-40, and of sufficient area to provide for wheelchair manoeuvrability (d) kerb ramps at pedestrian crossing points.	DTS/DPF 38.1 None are applicable.
Communal Open Space	
PO 39.1 Development is designed to provide attractive, convenient and comfortable indoor and outdoor communal areas to be used by residents and visitors.	DTS/DPF 39.1 None are applicable.
PO 39.2 Private open space provision may be substituted for communal open space which is designed and sited to meet the recreation and amenity needs of residents.	DTS/DPF 39.2 None are applicable.
PO 39.3 Communal open space is of sufficient size and dimensions to cater for	DTS/DPF 39.3 Communal open space incorporates a minimum dimension of 5

group recreation.	metres.
PO 39.4 Communal open space is designed and sited to: (a) be conveniently accessed by the dwellings which it services (b) have regard to acoustic, safety, security and wind effects.	DTS/DPF 39.4 None are applicable.
PO 39.5 Communal open space contains landscaping and facilities that are functional, attractive and encourage recreational use.	DTS/DPF 39.5 None are applicable.
PO 39.6 Communal open space is designed and sited to: (a) in relation to rooftop or elevated gardens, minimise overlooking into habitable room windows or onto the useable private open space of other dwellings (b) in relation to ground floor communal space, be overlooked by habitable rooms to facilitate passive surveillance.	DTS/DPF 39.6 None are applicable.
Site Facilities / Waste Storage	
PO 40.1 Development is designed to provide storage areas for personal items and specialised equipment such as small electric powered vehicles, including facilities for the recharging of small electric-powered vehicles.	DTS/DPF 40.1 None are applicable.
PO 40.2 Provision is made for suitable mailbox facilities close to the major pedestrian entry to the site or conveniently located considering the nature of accommodation and mobility of occupants.	DTS/DPF 40.2 None are applicable.
PO 40.3 Provision is made for suitable external clothes drying facilities.	DTS/DPF 40.3 None are applicable.
PO 40.4 Provision is made for suitable household waste and recyclable material storage facilities conveniently located away, or screened, from view.	DTS/DPF 40.4 None are applicable.
PO 40.5 Waste and recyclable material storage areas are located away from dwellings.	DTS/DPF 40.5 Dedicated waste and recyclable material storage areas are located at least 3m from any habitable room window.
PO 40.6 Provision is made for on-site waste collection where 10 or more bins are to be collected at any one time.	DTS/DPF 40.6 None are applicable.
PO 40.7 Services, including gas and water meters, are conveniently located and screened from public view.	DTS/DPF 40.7 None are applicable.
Student Accommodation	
PO 41.1 Student accommodation is designed to provide safe, secure, attractive, convenient and comfortable living conditions for residents, including an internal layout and facilities that are designed to provide sufficient space and amenity for the requirements of student life and promote social interaction.	DTS/DPF 41.1 Student accommodation provides: (a) a range of living options to meet a variety of accommodation needs, such as one-bedroom, two-bedroom and disability access units (b) common or shared facilities to enable a more efficient use of space, including: (i) shared cooking, laundry and external drying facilities

	(ii) internal and external communal and private open space provided in accordance with Design in Urban Areas Table 1 - Private Open Space (iii) common storage facilities at the rate of $8m^3$ for every 2 dwellings or students (iv) common on-site parking in accordance with Transport, Access and Parking Table 1 - General Off-Street Car Parking Requirements or Table 2 - Off-Street Car Parking Requirements in Designated Areas (v) bicycle parking at the rate of one space for every 2 students.
PO 41.2 Student accommodation is designed to provide easy adaptation of the building to accommodate an alternative use of the building in the event it is no longer required for student housing.	DTS/DPF 41.2 None are applicable.
All non-residential development	
Water Sensitive Design	
PO 42.1 Development likely to result in risk of export of sediment, suspended solids, organic matter, nutrients, oil and grease include stormwater management systems designed to minimise pollutants entering stormwater.	DTS/DPF 42.1 None are applicable.
PO 42.2 Water discharged from a development site is of a physical, chemical and biological condition equivalent to or better than its pre-developed state.	DTS/DPF 42.2 None are applicable.
PO 42.3 Development includes stormwater management systems to mitigate peak flows and manage the rate and duration of stormwater discharges from the site to ensure that development does not increase peak flows in downstream systems.	DTS/DPF 42.3 None are applicable.
Wash-down and Waste Loading and Unloading	
PO 43.1 Areas for activities including loading and unloading, storage of waste refuse bins in commercial and industrial development or wash-down areas used for the cleaning of vehicles, plant or equipment are: (a) designed to contain all wastewater likely to pollute stormwater within a bunded and roofed area to exclude the entry of external surface stormwater run-off (b) paved with an impervious material to facilitate wastewater collection (c) of sufficient size to prevent 'splash-out' or 'over-spray' of wastewater from the wash-down area (d) are designed to drain wastewater to either: (i) a treatment device such as a sediment trap and coalescing plate oil separator with subsequent disposal to a sewer, private or Community Wastewater Management Scheme or (ii) a holding tank and its subsequent removal off-site on a regular basis.	DTS/DPF 43.1 None are applicable.
Laneway Development	
Infrastructure and Access	
PO 44.1	DTS/DPF 44.1

Development with a primary street comprising a laneway, alley, lane, right of way or similar minor thoroughfare only occurs where: (a) existing utility infrastructure and services are capable of accommodating the development (b) the primary street can support access by emergency and regular service vehicles (such as waste collection) (c) it does not require the provision or upgrading of infrastructure on public land (such as footpaths and stormwater management systems) (d) safety of pedestrians or vehicle movement is maintained (e) any necessary grade transition is accommodated within the site of the development to support an appropriate development intensity and orderly development of land fronting minor thoroughfares.	Development with a primary street frontage that is not an alley, lane, right of way or similar public thoroughfare.

Decks

Design and Siting

PO 45.1 Decks are designed and sited to: (a) complement the associated building form (b) minimise impacts on the streetscape through siting behind the building line of the principal building (unless on a significant allotment or open space) (c) minimise cut and fill and overall massing when viewed from adjacent land.	DTS/DPF 45.1 Decks: (a) where ancillary to a dwelling: (i) are not constructed, added to or altered so that any part is situated: A. in front of any part of the building line of the dwelling to which it is ancillary or B. within 900mm of a boundary of the allotment with a secondary street (if the land has boundaries on two or more roads) (ii) are set back at least 900mm from side or rear allotment boundaries (iii) when attached to the dwelling, has a finished floor level consistent with the finished ground floor level of the dwelling (iv) where associated with a residential use, retains a total area of soft landscaping for the entire development site, including any common property, with a minimum dimension of 700mm in accordance with (A) or (B), whichever is less: A. a total area is determined by the following table:

Site area (or in the case of residential flat building or group dwelling(s), average site area) (m^2)	Minimum percentage of site
<150	10%
150-200	15%
>200-450	20%
>450	25%

B. the amount of existing soft landscaping prior to the development occurring.

(b) where in association with a non-residential use:
(i) are set back at least 2 metres from the boundary of an allotment used for residential purposes.
(ii) are set back at least 2 metres from a public road.
(iii) have a floor area not exceeding 25m^2

	(c) in all cases, has a finished floor level not exceeding 1 metre above natural ground level at any point.
PO 45.2 Decks are designed and sited to minimise direct overlooking of habitable rooms and private open spaces of adjoining residential uses in neighbourhood-type zones through suitable floor levels, screening and siting taking into account the slope of the subject land, existing vegetation on the subject land, and fencing.	DTS/DPF 45.2 Decks with a finished floor level/s 500mm or more above natural ground level facing side or rear boundaries shared with a residential use in a neighbourhood-type zone incorporate screening with a maximum of 25% transparency/openings, permanently fixed to the outer edge of the deck not less than 1.5 m above the finished floor level/s.
PO 45.3 Decks used for outdoor dining, entertainment or other commercial uses provide carparking in accordance with the primary use of the deck.	DTS/DPF 45.3 Decks used for commercial purposes do not result in less on-site car parking for the primary use of the subject land than specified in Transport, Access and Parking Table 1 - General Off-Street Car Parking Requirements or Table 2 - Off-Street Car Parking Requirements in Designated Areas.

Table 1 - Private Open Space

Dwelling Type	Dwelling / Site Configuration	Minimum Rate
Dwelling (at ground level, other than a residential flat building that includes above ground dwellings)		Total private open space area: (a) Site area <301m^2: 24m^2 located behind the building line. (b) Site area ≥ 301m^2: 60m^2 located behind the building line. Minimum directly accessible from a living room: 16m^2 / with a minimum dimension 3m.
Cabin or caravan (permanently fixed to the ground) in a residential park or caravan and tourist park		Total area: 16m^2, which may be uses as second car parking space, provided on each site intended for residential occupation.
Dwelling in a residential flat building or mixed use building which incorporate above ground level dwellings	Dwellings at ground level:	15m^2 / minimum dimension 3m
	Dwellings above ground level:	
	Studio (no separate bedroom)	4m^2 / minimum dimension 1.8m
	One bedroom dwelling	8m^2 / minimum dimension 2.1m
	Two bedroom dwelling	11m^2 / minimum dimension 2.4m
	Three + bedroom dwelling	15 m^2 / minimum dimension 2.6m

Forestry

Assessment Provisions (AP)

Desired Outcome (DO)

Desired Outcome	
DO 1	Commercial forestry is designed and sited to maximise economic benefits whilst managing potential negative impacts on the environment, transport networks, surrounding land uses and landscapes.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
Siting	
PO 1.1 Commercial forestry plantations are established where there is no detrimental effect on the physical environment or scenic quality of the rural landscape.	DTS/DPF 1.1 None are applicable.
PO 1.2 Commercial forestry plantations are established on slopes that are stable to minimise the risk of soil erosion.	DTS/DPF 1.2 Commercial forestry plantations are not located on land with a slope exceeding 20% (1-in-5).
PO 1.3 Commercial forestry plantations and operations associated with their establishment, management and harvesting are appropriately set back from any sensitive receiver to minimise fire risk and noise disturbance.	DTS/DPF 1.3 Commercial forestry plantations and operations associated with their establishment, management and harvesting are set back 50m or more from any sensitive receiver.
Water Protection	
PO 2.1 Commercial forestry plantations incorporate artificial drainage lines (i.e. culverts, runoffs and constructed drains) integrated with natural drainage lines to minimise concentrated water flows onto or from plantation areas.	DTS/DPF 2.1 None are applicable.
PO 2.2 Appropriate siting, layout and design measures are adopted to minimise the impact of commercial forestry plantations on surface water resources.	DTS/DPF 2.2 Commercial forestry plantations: (a) do not involve cultivation (excluding spot cultivation) in drainage lines (b) are set back 20m or more from the banks of any major watercourse (a third order or higher watercourse), lake, reservoir, wetland or sinkhole (with direct connection to an aquifer) (c) are set back 10m or more from the banks of any first or second order watercourse or sinkhole (with no direct connection to an aquifer).
Fire Management	
PO 3.1 Commercial forestry plantations incorporate appropriate firebreaks and fire management design elements.	DTS/DPF 3.1 Commercial forestry plantations provide: (a) 7m or more wide external boundary firebreaks for plantations of 40ha or less (b) 10m or more wide external boundary firebreaks for plantations of between 40ha and 100ha (c) 20m or more wide external boundary firebreaks, or 10m with an additional 10m or more of fuel-reduced plantation, for plantations of 100ha or greater. Note: Firebreaks prescribed above (as well as access tracks) may be included within the setback buffer distances prescribed by other policies of the Code.

PO 3.2 Commercial forestry plantations incorporate appropriate fire management access tracks.	DTS/DPF 3.2 Commercial forestry plantation fire management access tracks: (a) are incorporated within all firebreaks (b) are 7m or more wide with a vertical clearance of 4m or more (c) are aligned to provide straight through access at junctions, or if they are a no through access track are appropriately signposted and provide suitable turnaround areas for fire-fighting vehicles (d) partition the plantation into units of 40ha or less in area.
Power-line Clearances	
PO 4.1 Commercial forestry plantations achieve and maintain appropriate clearances from aboveground powerlines.	DTS/DPF 4.1 Commercial forestry plantations incorporating trees with an expected mature height of greater than 6m meet the clearance requirements listed in the following table:

Voltage of transmission line	Tower or Pole	Minimum horizontal clearance distance between plantings and transmission lines
500 kV	Tower	38m
275 kV	Tower	25m
132 kV	Tower	30m
132 kV	Pole	20m
66 kV	Pole	20m
Less than 66 kV	Pole	20m

Housing Renewal

Assessment Provisions (AP)

The Housing Renewal General Development Policies are only applicable to dwellings or residential flat building undertaken by:

(a) the South Australian Housing Trust either individually or jointly with other persons or bodies
or
(b) a provider registered under the Community Housing National Law participating in a program relating to the renewal of housing endorsed by the South Australian Housing Trust.

Desired Outcome (DO)

	Desired Outcome
DO 1	Renewed residential environments replace older social housing and provide new social housing infrastructure and other housing options and tenures to enhance the residential amenity of the local area.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
Land Use and Intensity	
PO 1.1 Residential development provides a range of housing choices.	DTS/DPF 1.1 Development comprises one or more of the following:

	(a) detached dwellings (b) semi-detached dwellings (c) row dwellings (d) group dwellings (e) residential flat buildings.
PO 1.2 Medium-density housing options or higher are located in close proximity to public transit, open space and/or activity centres.	DTS/DPF 1.2 None are applicable.
Building Height	
PO 2.1 Buildings generally do not exceed 3 building levels unless in locations close to public transport, centres and/or open space.	DTS/DPF 2.1 Building height (excluding garages, carports and outbuildings) does not exceed 3 building levels and 12m and wall height does not exceed 9m (not including a gable end).
PO 2.2 Medium or high rise residential flat buildings located within or at the interface with zones which restrict heights to a maximum of 2 building levels transition down in scale and height towards the boundary of that zone, other than where it is a street boundary.	DTS/DPF 2.2 None are applicable.
Primary Street Setback	
PO 3.1 Buildings are set back from the primary street boundary to contribute to an attractive streetscape character.	DTS/DPF 3.1 Buildings are no closer to the primary street (excluding any balcony, verandah, porch, awning or similar structure) than 3m.
Secondary Street Setback	
PO 4.1 Buildings are set back from secondary street boundaries to maintain separation between building walls and public streets and contribute to a suburban streetscape character.	DTS/DPF 4.1 Buildings are set back at least 900mm from the boundary of the allotment with a secondary street frontage.
Boundary Walls	
PO 5.1 Boundary walls are limited in height and length to manage visual impacts and access to natural light and ventilation.	DTS/DPF 5.1 Except where the dwelling is located on a central site within a row dwelling or terrace arrangement, dwellings with side boundary walls are sited on only one side boundary and satisfy (a) or (b): (a) adjoin or abut a boundary wall of a building on adjoining land for the same length and height (b) do not: (i) exceed 3.2m in height from the lower of the natural or finished ground level (ii) exceed 11.5m in length (iii) when combined with other walls on the boundary of the subject development site, a maximum 45% of the length of the boundary (iv) encroach within 3 metres of any other existing or proposed boundary walls on the subject land.
PO 5.2 Dwellings in a semi-detached, row or terrace arrangement maintain space between buildings consistent with a suburban streetscape character.	DTS/DPF 5.2 Dwellings in a semi-detached or row arrangement are set back 900mm or more from side boundaries shared with allotments outside the development site, except for a carport or garage.
Side Boundary Setback	
PO 6.1 Buildings are set back from side boundaries to provide:	DTS/DPF 6.1 Other than walls located on a side boundary, buildings are set back

(a) separation between dwellings in a way that contributes to a suburban character (b) access to natural light and ventilation for neighbours.	from side boundaries in accordance with the following: (a) where the wall height does not exceed 3m - at least 900mm (b) for a wall that is not south facing and the wall height exceeds 3m - at least 900mm from the boundary of the site plus a distance of 1/3 of the extent to which the height of the wall exceeds 3m from the top of the footings (c) for a wall that is south facing and the wall height exceeds 3m - at least 1.9m from the boundary of the site plus a distance of 1/3 of the extent to which the height of the wall exceeds 3m from the top of the footings.
Rear Boundary Setback	
PO 7.1 Buildings are set back from rear boundaries to provide: (a) separation between dwellings in a way that contributes to a suburban character (b) access to natural light and ventilation for neighbours (c) private open space (d) space for landscaping and vegetation.	DTS/DPF 7.1 Dwellings are set back from the rear boundary: (a) 3m or more for the first building level (b) 5m or more for any subsequent building level.
Buildings elevation design	
PO 8.1 Dwelling elevations facing public streets and common driveways make a positive contribution to the streetscape and common driveway areas.	DTS/DPF 8.1 Each dwelling includes at least 3 of the following design features within the building elevation facing a primary street, and at least 2 of the following design features within the building elevation facing any other public road (other than a laneway) or a common driveway: (a) a minimum of 30% of the building elevation is set back an additional 300mm from the building line (b) a porch or portico projects at least 1m from the building elevation (c) a balcony projects from the building elevation (d) a verandah projects at least 1m from the building elevation (e) eaves of a minimum 400mm width extend along the width of the front elevation (f) a minimum 30% of the width of the upper level projects forward from the lower level primary building line by at least 300mm. (g) a minimum of two different materials or finishes are incorporated on the walls of the building elevation, with a maximum of 80% of the building elevation in a single material or finish.
PO 8.2 Dwellings incorporate windows along primary street frontages to encourage passive surveillance and make a positive contribution to the streetscape.	DTS/DPF 8.2 Each dwelling with a frontage to a public street: (a) includes at least one window facing the primary street from a habitable room that has a minimum internal room dimension of 2.4m (b) has an aggregate window area of at least $2m^2$ facing the primary street
PO 8.3 The visual mass of larger buildings is reduced when viewed from adjoining allotments or public streets.	DTS/DPF 8.3 None are applicable.
PO 8.4 Built form considers local context and provides a quality design response through scale, massing, materials, colours and architectural expression.	DTS/DPF 8.4 None are applicable.
PO 8.5	DTS/DPF 8.5

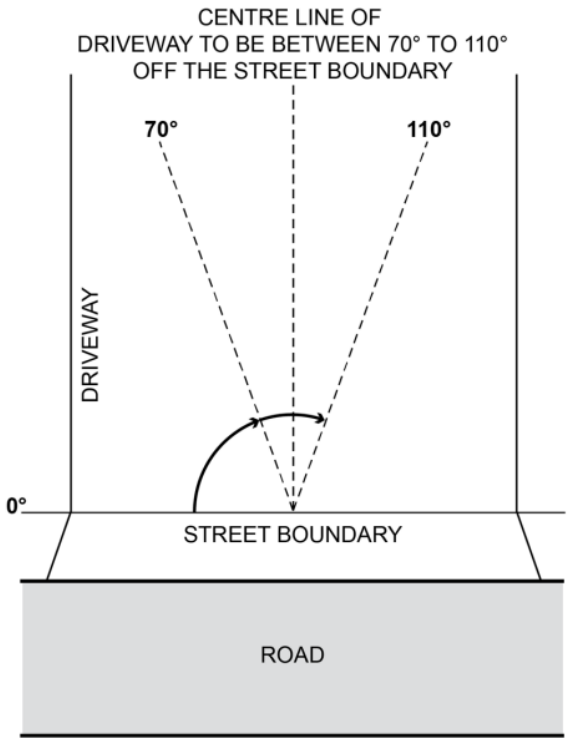
Entrances to multi-storey buildings are: (a) oriented towards the street (b) visible and easily identifiable from the street (c) designed to include a common mail box structure.	None are applicable.
Outlook and amenity	
PO 9.1 Living rooms have an external outlook to provide a high standard of amenity for occupants.	DTS/DPF 9.1 A living room of a dwelling incorporates a window with an external outlook towards the street frontage or private open space.
PO 9.2 Bedrooms are separated or shielded from active communal recreation areas, common access areas and vehicle parking areas and access ways to mitigate noise and artificial light intrusion.	DTS/DPF 9.2 None are applicable.
Private Open Space	
PO 10.1 Dwellings are provided with suitable sized areas of usable private open space to meet the needs of occupants.	DTS/DPF 10.1 Private open space is provided in accordance with the following table:

Dwelling Type	Dwelling / Site Configuration	Minimum Rate
Dwelling (at ground level)		Total area: 24m^2 located behind the building line Minimum adjacent to a living room: 16m^2 with a minimum dimension 3m
Dwelling (above ground level)	Studio	4m^2 / minimum dimension 1.8m
	One bedroom dwelling	8m^2 / minimum dimension 2.1m
	Two bedroom dwelling	11m^2 / minimum dimension 2.4m
	Three + bedroom dwelling	15 m^2 / minimum dimension 2.6m

PO 10.2 Private open space positioned to provide convenient access from internal living areas.	DTS/DPF 10.2 At least 50% of the required area of private open space is accessible from a habitable room.
PO 10.3 Private open space is positioned and designed to: (a) provide useable outdoor space that suits the needs of occupants; (b) take advantage of desirable orientation and vistas; and (c) adequately define public and private space.	DTS/DPF 10.3 None are applicable.
Visual privacy	
PO 11.1 Development mitigates direct overlooking from upper level windows to habitable rooms and private open spaces of adjoining residential uses.	DTS/DPF 11.1 Upper level windows facing side or rear boundaries shared with another residential allotment/site satisfy one of the following:

	(a) are permanently obscured to a height of 1.5m above finished floor level and are fixed or not capable of being opened more than 200mm (b) have sill heights greater than or equal to 1.5m above finished floor level (c) incorporate screening with a maximum of 25% openings, permanently fixed no more than 500mm from the window surface and sited adjacent to any part of the window less than 1.5m above the finished floor.
PO 11.2 Development mitigates direct overlooking from upper level balconies and terraces to habitable rooms and private open space of adjoining residential uses.	DTS/DPF 11.2 One of the following is satisfied: (a) the longest side of the balcony or terrace will face a public road, public road reserve or public reserve that is at least 15m wide in all places faced by the balcony or terrace or (b) all sides of balconies or terraces on upper building levels are permanently obscured by screening with a maximum 25% transparency/openings fixed to a minimum height of: (i) 1.5m above finished floor level where the balcony is located at least 15 metres from the nearest habitable window of a dwelling on adjacent land or (ii) 1.7m above finished floor level in all other cases
Landscaping	
PO 12.1 Soft landscaping is incorporated into development to: (a) minimise heat absorption and reflection (b) maximise shade and shelter (c) maximise stormwater infiltration and biodiversity (d) enhance the appearance of land and streetscapes.	DTS/DPF 12.1 Residential development incorporates pervious areas for soft landscaping with a minimum dimension of 700mm provided in accordance with (a) and (b): (a) a total area as determined by the following table: Dwelling site area (or in the case of residential flat building or group dwelling(s), average site area) (m2) / Minimum percentage of site <150 / 10% <200 / 15% 200-450 / 20% >450 / 25% (b) at least 30% of land between the road boundary and the building line.
Water Sensitive Design	
PO 13.1 Residential development is designed to capture and use stormwater to: (a) maximise efficient use of water resources (b) manage peak stormwater runoff flows and volume to ensure the carrying capacities of downstream systems are not overloaded (c) manage runoff quality to maintain, as close as practical, pre-development conditions.	DTS/DPF 13.1 None are applicable.
Car Parking	
PO 14.1 On-site car parking is provided to meet the anticipated demand of residents, with less on-site parking in areas in close proximity to public transport.	DTS/DPF 14.1 On-site car parking is provided at the following rates per dwelling: (a) 2 or fewer bedrooms - 1 car parking space (b) 3 or more bedrooms - 2 car parking spaces.
PO 14.2	DTS/DPF 14.2

Enclosed car parking spaces are of dimensions to be functional, accessible and convenient.	Residential parking spaces enclosed by fencing, walls or other obstructions with the following internal dimensions (separate from any waste storage area): (a) single parking spaces: (i) a minimum length of 5.4m (ii) a minimum width of 3.0m (iii) a minimum garage door width of 2.4m (b) double parking spaces (side by side): (i) a minimum length of 5.4m (ii) a minimum width of 5.5m (iii) minimum garage door width of 2.4m per space.
PO 14.3 Uncovered car parking spaces are of dimensions to be functional, accessible and convenient.	DTS/DPF 14.3 Uncovered car parking spaces have: (a) a minimum length of 5.4m (b) a minimum width of 2.4m (c) a minimum width between the centre line of the space and any fence, wall or other obstruction of 1.5m.
PO 14.4 Residential flat buildings and group dwelling developments provide sufficient on-site visitor car parking to cater for anticipated demand.	DTS/DPF 14.4 Visitor car parking for group and residential flat buildings incorporating 4 or more dwellings is provided on-site at a minimum ratio of 0.25 car parking spaces per dwelling.
PO 14.5 Residential flat buildings provide dedicated areas for bicycle parking.	DTS/DPF 14.5 Residential flat buildings provide one bicycle parking space per dwelling.
Overshadowing	
PO 15.1 Development minimises overshadowing of the private open spaces of adjoining land by ensuring that ground level open space associated with residential buildings receive direct sunlight for a minimum of 2 hours between 9am and 3pm on 21 June.	DTS/DPF 15.1 None are applicable.
Waste	
PO 16.1 Provision is made for the convenient storage of waste bins in a location screened from public view.	DTS/DPF 16.1 A waste bin storage area is provided behind the primary building line that: (a) has a minimum area of $2m^2$ with a minimum dimension of 900mm (separate from any designated car parking spaces or private open space).; and (b) has a continuous unobstructed path of travel (excluding moveable objects like gates, vehicles and roller doors) with a minimum width of 800mm between the waste bin storage area and the street.
PO 16.2 Residential flat buildings provide a dedicated area for the on-site storage of waste which is: (a) easily and safely accessible for residents and for collection vehicles (b) screened from adjoining land and public roads (c) of sufficient dimensions to be able to accommodate the waste storage needs of the development considering the intensity and nature of the development and the frequency of collection.	DTS/DPF 16.2 None are applicable.

Vehicle Access	
PO 17.1 Driveways are located and designed to facilitate safe access and egress while maximising land available for street tree planting, landscaped street frontages and on-street parking.	DTS/DPF 17.1 None are applicable.
PO 17.2 Vehicle access is safe, convenient, minimises interruption to the operation of public roads and does not interfere with street infrastructure or street trees.	DTS/DPF 17.2 Vehicle access to designated car parking spaces satisfy (a) or (b): (a) is provided via a lawfully existing or authorised access point or an access point for which consent has been granted as part of an application for the division of land (b) where newly proposed, is set back: (i) 0.5m or more from any street furniture, street pole, infrastructure services pit, or other stormwater or utility infrastructure unless consent is provided from the asset owner (ii) 2m or more from the base of the trunk of a street tree unless consent is provided from the tree owner for a lesser distance (iii) 6m or more from the tangent point of an intersection of 2 or more roads (iv) outside of the marked lines or infrastructure dedicating a pedestrian crossing.
PO 17.3 Driveways are designed to enable safe and convenient vehicle movements from the public road to on-site parking spaces.	DTS/DPF 17.3 Driveways are designed and sited so that: (a) the gradient of the driveway does not exceed a grade of 1 in 4 and includes transitions to ensure a maximum grade change of 12.5% (1 in 8) for summit changes, and 15% (1 in 6.7) for sag changes, in accordance with AS 2890.1:2004 to prevent vehicles bottoming or scraping (b) the centreline of the driveway has an angle of no less than 70 degrees and no more than 110 degrees from the street boundary to which it takes its access as shown in the following diagram: 

	(c) if located to provide access from an alley, lane or right of way - the alley, land or right or way is at least 6.2m wide along the boundary of the allotment / site.
PO 17.4 Driveways and access points are designed and distributed to optimise the provision of on-street parking.	DTS/DPF 17.4 Where on-street parking is available abutting the site's street frontage, on-street parking is retained in accordance with the following requirements: (a) minimum 0.33 on-street spaces per dwelling on the site (rounded up to the nearest whole number) (b) minimum car park length of 5.4m where a vehicle can enter or exit a space directly (c) minimum carpark length of 6m for an intermediate space located between two other parking spaces or to an end obstruction where the parking is indented.
PO 17.5 Residential driveways that service more than one dwelling of a dimension to allow safe and convenient movement.	DTS/DPF 17.5 Driveways that service more than 1 dwelling or a dwelling on a battle-axe site: (a) have a minimum width of 3m (b) for driveways servicing more than 3 dwellings: (i) have a width of 5.5m or more and a length of 6m or more at the kerb of the primary street (ii) where the driveway length exceeds 30m, incorporate a passing point at least every 30 metres with a minimum width of 5.5m and a minimum length of 6m.
PO 17.6 Residential driveways that service more than one dwelling are designed to allow passenger vehicles to enter and exit the site and manoeuvre within the site in a safe and convenient manner.	DTS/DPF 17.6 Driveways providing access to more than one dwelling, or a dwelling on a battle-axe site, allow a B85 passenger vehicle to enter and exit the garages or parking spaces in no more than a three-point turn manoeuvre
PO 17.7 Dwellings are adequately separated from common driveways and manoeuvring areas.	DTS/DPF 17.7 Dwelling walls with entry doors or ground level habitable room windows are set back at least 1.5m from any driveway or area designated for the movement and manoeuvring of vehicles.
Storage	
PO 18.1 Dwellings are provided with sufficient and accessible space for storage to meet likely occupant needs.	DTS/DPF 18.1 Dwellings are provided with storage at the following rates and 50% or more of the storage volume is provided within the dwelling: (a) studio: not less than $6m^3$ (b) 1 bedroom dwelling / apartment: not less than $8m^3$ (c) 2 bedroom dwelling / apartment: not less than $10m^3$ (d) 3+ bedroom dwelling / apartment: not less than $12m^3$.
Earthworks	
PO 19.1 Development, including any associated driveways and access tracks, minimises the need for earthworks to limit disturbance to natural topography.	DTS/DPF 19.1 The development does not involve: (a) excavation exceeding a vertical height of 1m or (b) filling exceeding a vertical height of 1m or (c) a total combined excavation and filling vertical height exceeding 2m.
Service connections and infrastructure	
PO 20.1 Dwellings are provided with appropriate service connections and	DTS/DPF 20.1 The site and building:

infrastructure.	(a) have the ability to be connected to a permanent potable water supply (b) have the ability to be connected to a sewerage system, or a wastewater system approved under the *South Australian Public Health Act 2011* (c) have the ability to be connected to electricity supply (d) have the ability to be connected to an adequate water supply (and pressure) for fire-fighting purposes (e) would not be contrary to the Regulations prescribed for the purposes of Section 86 of the *Electricity Act 1996*.
Site contamination	
PO 21.1 Land that is suitable for sensitive land uses to provide a safe environment.	DTS/DPF 21.1 Development satisfies (a), (b), (c) or (d): (a) does not involve a change in the use of land (b) involves a change in the use of land that does not constitute a change to a more sensitive use (c) involves a change in the use of land to a more sensitive use on land at which site contamination does not exist (as demonstrated in a site contamination declaration form) (d) involves a change in the use of land to a more sensitive use on land at which site contamination exists, or may exist (as demonstrated in a site contamination declaration form), and satisfies both of the following: (i) a site contamination audit report has been prepared under Part 10A of the *Environment Protection Act 1993* in relation to the land within the previous 5 years which states that A. site contamination does not exist (or no longer exists) at the land or B. the land is suitable for the proposed use or range of uses (without the need for any further remediation) or C. where remediation is, or remains, necessary for the proposed use (or range of uses), remediation work has been carried out or will be carried out (and the applicant has provided a written undertaking that the remediation works will be implemented in association with the development) and (ii) no other class 1 activity or class 2 activity has taken place at the land since the preparation of the site contamination audit report (as demonstrated in a site contamination declaration form).

Infrastructure and Renewable Energy Facilities

Assessment Provisions (AP)

Desired Outcome (DO)

Desired Outcome	
DO 1	Efficient provision of infrastructure networks and services, renewable energy facilities and ancillary development in a manner that

	minimises hazard, is environmentally and culturally sensitive and manages adverse visual impacts on natural and rural landscapes and residential amenity.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
General	
PO 1.1 Development is located and designed to minimise hazard or nuisance to adjacent development and land uses.	DTS/DPF 1.1 None are applicable.
Visual Amenity	
PO 2.1 The visual impact of above-ground infrastructure networks and services (excluding high voltage transmission lines), renewable energy facilities (excluding wind farms), energy storage facilities and ancillary development is minimised from townships, scenic routes and public roads by: (a) utilising features of the natural landscape to obscure views where practicable (b) siting development below ridgelines where practicable (c) avoiding visually sensitive and significant landscapes (d) using materials and finishes with low-reflectivity and colours that complement the surroundings (e) using existing vegetation to screen buildings (f) incorporating landscaping or landscaped mounding around the perimeter of a site and between adjacent allotments accommodating or zoned to primarily accommodate sensitive receivers.	DTS/DPF 2.1 None are applicable.
PO 2.2 Pumping stations, battery storage facilities, maintenance sheds and other ancillary structures incorporate vegetation buffers to reduce adverse visual impacts on adjacent land.	DTS/DPF 2.2 None are applicable.
PO 2.3 Surfaces exposed by earthworks associated with the installation of storage facilities, pipework, penstock, substations and other ancillary plant are reinstated and revegetated to reduce adverse visual impacts on adjacent land.	DTS/DPF 2.3 None are applicable.
Rehabilitation	
PO 3.1 Progressive rehabilitation (incorporating revegetation) of disturbed areas, ahead of or upon decommissioning of areas used for renewable energy facilities and transmission corridors.	DTS/DPF 3.1 None are applicable.
Hazard Management	
PO 4.1 Infrastructure and renewable energy facilities and ancillary development located and operated to not adversely impact maritime or air transport safety, including the operation of ports, airfields and landing strips.	DTS/DPF 4.1 None are applicable.
PO 4.2 Facilities for energy generation, power storage and transmission are separated as far as practicable from dwellings, tourist accommodation and frequently visited public places	DTS/DPF 4.2 None are applicable.

(such as viewing platforms / lookouts) to reduce risks to public safety from fire or equipment malfunction.	
PO 4.3 Bushfire hazard risk is minimised for renewable energy facilities by providing appropriate access tracks, safety equipment and water tanks and establishing cleared areas around substations, battery storage and operations compounds.	DTS/DPF 4.3 None are applicable.
Electricity Infrastructure and Battery Storage Facilities	
PO 5.1 Electricity infrastructure is located to minimise visual impacts through techniques including: (a) siting utilities and services: (i) on areas already cleared of native vegetation (ii) where there is minimal interference or disturbance to existing native vegetation or biodiversity (b) grouping utility buildings and structures with non-residential development, where practicable.	DTS/DPF 5.1 None are applicable.
PO 5.2 Electricity supply (excluding transmission lines) serving new development in urban areas and townships installed underground, excluding lines having a capacity exceeding or equal to 33kV.	DTS/DPF 5.2 None are applicable.
PO 5.3 Battery storage facilities are co-located with substation infrastructure where practicable to minimise the development footprint and reduce environmental impacts.	DTS/DPF 5.3 None are applicable.
Telecommunication Facilities	
PO 6.1 The proliferation of telecommunications facilities in the form of towers/monopoles in any one locality is managed, where technically feasible, by co-locating a facility with other communications facilities to mitigate impacts from clutter on visual amenity.	DTS/DPF 6.1 None are applicable.
PO 6.2 Telecommunications antennae are located as close as practicable to support structures to manage overall bulk and mitigate impacts on visual amenity.	DTS/DPF 6.2 None are applicable.
PO 6.3 Telecommunications facilities, particularly towers/monopoles, are located and sized to mitigate visual impacts by the following methods: (a) where technically feasible, incorporating the facility within an existing structure that may serve another purpose or all of the following:	DTS/DPF 6.3 None are applicable.

(b) using existing buildings and landscape features to obscure or interrupt views of a facility from nearby public roads, residential areas and places of high public amenity to the extent practical without unduly hindering the effective provision of telecommunications services (c) using materials and finishes that complement the environment (d) screening using landscaping and vegetation, particularly for equipment shelters and huts.	
Renewable Energy Facilities	
PO 7.1 Renewable energy facilities are located as close as practicable to existing transmission infrastructure to facilitate connections and minimise environmental impacts as a result of extending transmission infrastructure.	DTS/DPF 7.1 None are applicable.
Renewable Energy Facilities (Wind Farm)	
PO 8.1 Visual impact of wind turbine generators on the amenity of residential and tourist development is reduced through appropriate separation.	DTS/DPF 8.1 Wind turbine generators are: (a) set back at least 2000m from the base of a turbine to any of the following zones: (i) Rural Settlement Zone (ii) Township Zone (iii) Rural Living Zone (iv) Rural Neighbourhood Zone with an additional 10m setback per additional metre over 150m overall turbine height (measured from the base of the turbine). (b) set back at least 1500m from the base of the turbine to non-associated (non-stakeholder) dwellings and tourist accommodation
PO 8.2 The visual impact of wind turbine generators on natural landscapes is managed by: (a) designing wind turbine generators to be uniform in colour, size and shape (b) coordinating blade rotation and direction (c) mounting wind turbine generators on tubular towers as opposed to lattice towers.	DTS/DPF 8.2 None are applicable.
PO 8.3 Wind turbine generators and ancillary development minimise potential for bird and bat strike.	DTS/DPF 8.3 None are applicable.
PO 8.4 Wind turbine generators incorporate recognition systems or physical markers to minimise the risk to aircraft operations.	DTS/DPF 8.4 No Commonwealth air safety (CASA / ASA) or Defence requirement is applicable.
PO 8.5 Meteorological masts and guidewires are identifiable to aircraft through the use of colour bands, marker balls, high visibility sleeves or flashing strobes.	DTS/DPF 8.5 None are applicable.
Renewable Energy Facilities (Solar Power)	
PO 9.1 Ground mounted solar power facilities generating 5MW or more are not located on land requiring the clearance of areas of intact native vegetation or on land of high environmental, scenic or cultural value.	DTS/DPF 9.1 None are applicable.

PO 9.2

Ground mounted solar power facilities allow for movement of wildlife by:

(a) incorporating wildlife corridors and habitat refuges
(b) avoiding the use of extensive security or perimeter fencing or incorporating fencing that enables the passage of small animals without unreasonably compromising the security of the facility.

DTS/DPF 9.2

None are applicable.

PO 9.3

Amenity impacts of solar power facilities are minimised through separation from conservation areas and sensitive receivers in other ownership.

DTS/DPF 9.3

Ground mounted solar power facilities are set back from land boundaries, conservation areas and relevant zones in accordance with the following criteria:

Generation Capacity	Approximate size of array	Setback from adjoining land boundary	Setback from conservation areas	Setback from Township, Rural Settlement, Rural Neighbourhood and Rural Living Zones[1]
50MW>	80ha+	30m	500m	2km
10MW<50MW	16ha-<80ha	25m	500m	1.5km
5MW<10MW	8ha to <16ha	20m	500m	1km
1MW<5MW	1.6ha to <8ha	15m	500m	500m
100kW<1MW	0.5ha<1.6ha	10m	500m	100m
<100kW	<0.5ha	5m	500m	25m

Notes:

1. Does not apply when the site of the proposed ground mounted solar power facility is located within one of these zones.

PO 9.4

Ground mounted solar power facilities incorporate landscaping within setbacks from adjacent road frontages and boundaries of adjacent allotments accommodating non-host dwellings, where balanced with infrastructure access and bushfire safety considerations.

DTS/DPF 9.4

None are applicable.

Hydropower / Pumped Hydropower Facilities

PO 10.1

Hydropower / pumped hydropower facility storage is designed and operated to minimise the risk of storage dam failure.

DTS/DPF 10.1

None are applicable.

PO 10.2

Hydropower / pumped hydropower facility storage is designed and operated to minimise water loss through increased evaporation or system leakage, with the incorporation of appropriate liners, dam covers, operational measures or detection systems.

DTS/DPF 10.2

None are applicable.

PO 10.3

Hydropower / pumped hydropower facilities on existing or former mine sites minimise environmental impacts from site contamination, including from mine operations or water

DTS/DPF 10.3

None are applicable.

sources subject to such processes, now or in the future.	
Water Supply	
PO 11.1 Development is connected to an appropriate water supply to meet the ongoing requirements of the intended use.	DTS/DPF 11.1 Development is connected, or will be connected, to a reticulated water scheme or mains water supply with the capacity to meet the on-going requirements of the development.
PO 11.2 Dwellings are connected to a reticulated water scheme or mains water supply with the capacity to meet the requirements of the intended use. Where this is not available an appropriate rainwater tank or storage system for domestic use is provided.	DTS/DPF 11.2 A dwelling is connected, or will be connected, to a reticulated water scheme or mains water supply with the capacity to meet the requirements of the development. Where this is not available it is serviced by a rainwater tank or tanks capable of holding at least 50,000 litres of water which is: (a) exclusively for domestic use (b) connected to the roof drainage system of the dwelling.
Wastewater Services	
PO 12.1 Development is connected to an approved common wastewater disposal service with the capacity to meet the requirements of the intended use. Where this is not available an appropriate on-site service is provided to meet the ongoing requirements of the intended use in accordance with the following: (a) it is wholly located and contained within the allotment of the development it will service (b) in areas where there is a high risk of contamination of surface, ground, or marine water resources from on-site disposal of liquid wastes, disposal systems are included to minimise the risk of pollution to those water resources (c) septic tank effluent drainage fields and other wastewater disposal areas are located away from watercourses and flood prone, sloping, saline or poorly drained land to minimise environmental harm.	DTS/DPF 12.1 Development is connected, or will be connected, to an approved common wastewater disposal service with the capacity to meet the requirements of the development. Where this is not available it is instead capable of being serviced by an on-site waste water treatment system in accordance with the following: (a) the system is wholly located and contained within the allotment of development it will service; and (b) the system will comply with the requirements of the South Australian Public Health Act 2011.
PO 12.2 Effluent drainage fields and other wastewater disposal areas are maintained to ensure the effective operation of waste systems and minimise risks to human health and the environment.	DTS/DPF 12.2 Development is not built on, or encroaches within, an area that is, or will be, required for a sewerage system or waste control system.
Temporary Facilities	
PO 13.1 In rural and remote locations, development that is likely to generate significant waste material during construction, including packaging waste, makes provision for a temporary on-site waste storage enclosure to minimise the incidence of wind-blown litter.	DTS/DPF 13.1 A waste collection and disposal service is used to dispose of the volume of waste at the rate it is generated.
PO 13.2 Temporary facilities to support the establishment of renewable energy facilities (including borrow pits, concrete batching plants, laydown, storage, access roads and worker amenity areas) are sited and operated to minimise environmental impact.	DTS/DPF 13.2 None are applicable.

Intensive Animal Husbandry and Dairies

Assessment Provisions (AP)

Desired Outcome (DO)

Desired Outcome	
DO 1	Development of intensive animal husbandry and dairies in locations that are protected from encroachment by sensitive receivers and in a manner that minimises their adverse effects on amenity and the environment.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
Siting and Design	
PO 1.1 Intensive animal husbandry, dairies and associated activities are sited, designed, constructed and managed to not unreasonably impact on the environment or amenity of the locality.	DTS/DPF 1.1 None are applicable.
PO 1.2 Intensive animal husbandry, dairies and associated activities are sited, designed, constructed and managed to prevent the potential transmission of disease to other operations where animals are kept.	DTS/DPF 1.2 None are applicable.
PO 1.3 Intensive animal husbandry and associated activities such as wastewater lagoons and liquid/solid waste disposal areas are sited, designed, constructed and managed to not unreasonably impact on sensitive receivers in other ownership in terms of noise and air emissions.	DTS/DPF 1.3 None are applicable.
PO 1.4 Dairies and associated activities such as wastewater lagoons and liquid/solid waste disposal areas are sited, designed, constructed and managed to not unreasonably impact on sensitive receivers in other ownership in terms of noise and air emissions.	DTS/DPF 1.4 Dairies, associated wastewater lagoon(s) and liquid/solid waste storage and disposal facilities are located 500m or more from the nearest sensitive receiver in other ownership.
PO 1.5 Lagoons for the storage or treatment of milking shed effluent is adequately separated from roads to minimise impacts from odour on the general public.	DTS/DPF 1.5 Lagoons for the storage or treatment of milking shed effluent are set back 20m or more from public roads.
Waste	
PO 2.1 Storage of manure, used litter and other wastes (other than waste water lagoons) is sited, designed, constructed and managed to: (a) avoid attracting and harbouring vermin (b) avoid polluting water resources (c) be located outside 1% AEP flood event areas.	DTS/DPF 2.1 None are applicable.
Soil and Water Protection	
PO 3.1 To avoid environmental harm and adverse effects on water resources,	DTS/DPF 3.1 Intensive animal husbandry operations are set back:

intensive animal husbandry operations are appropriately set back from: (a) public water supply reservoirs (b) major watercourses (third order or higher stream) (c) any other watercourse, bore or well used for domestic or stock water supplies.	(a) 800m or more from a public water supply reservoir (b) 200m or more from a major watercourse (third order or higher stream) (c) 100m or more from any other watercourse, bore or well used for domestic or stock water supplies.
PO 3.2 Intensive animal husbandry operations and dairies incorporate appropriately designed effluent and run-off facilities that: (a) have sufficient capacity to hold effluent and runoff from the operations on site (b) ensure effluent does not infiltrate and pollute groundwater, soil or other water resources.	DTS/DPF 3.2 None are applicable.

Interface between Land Uses

Assessment Provisions (AP)

Desired Outcome (DO)

Desired Outcome	
DO 1	Development is located and designed to mitigate adverse effects on or from neighbouring and proximate land uses.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
General Land Use Compatibility	
PO 1.1 Sensitive receivers are designed and sited to protect residents and occupants from adverse impacts generated by lawfully existing land uses (or lawfully approved land uses) and land uses desired in the zone.	DTS/DPF 1.1 None are applicable.
PO 1.2 Development adjacent to a site containing a sensitive receiver (or lawfully approved sensitive receiver) or zone primarily intended to accommodate sensitive receivers is designed to minimise adverse impacts.	DTS/DPF 1.2 None are applicable.
Hours of Operation	
PO 2.1 Non-residential development does not unreasonably impact the amenity of sensitive receivers (or lawfully approved sensitive receivers) or an adjacent zone primarily for sensitive receivers through its hours of operation having regard to: (a) the nature of the development (b) measures to mitigate off-site impacts	DTS/DPF 2.1 Development operating within the following hours: Class of Development: Consulting room Hours of operation: 7am to 9pm, Monday to Friday 8am to 5pm, Saturday

(c) the extent to which the development is desired in the zone (d) measures that might be taken in an adjacent zone primarily for sensitive receivers that mitigate adverse impacts without unreasonably compromising the intended use of that land.	Office: 7am to 9pm, Monday to Friday; 8am to 5pm, Saturday Shop, other than any one or combination of the following: (a) restaurant (b) cellar door in the Productive Rural Landscape Zone, Rural Zone or Rural Horticulture Zone: 7am to 9pm, Monday to Friday; 8am to 5pm, Saturday and Sunday

Overshadowing	
PO 3.1 Overshadowing of habitable room windows of adjacent residential land uses in: a. a neighbourhood-type zone is minimised to maintain access to direct winter sunlight b. other zones is managed to enable access to direct winter sunlight.	DTS/DPF 3.1 North-facing windows of habitable rooms of adjacent residential land uses in a neighbourhood-type zone receive at least 3 hours of direct sunlight between 9.00am and 3.00pm on 21 June.
PO 3.2 Overshadowing of the primary area of private open space or communal open space of adjacent residential land uses in: a. a neighbourhood type zone is minimised to maintain access to direct winter sunlight b. other zones is managed to enable access to direct winter sunlight.	DTS/DPF 3.2 Development maintains 2 hours of direct sunlight between 9.00 am and 3.00 pm on 21 June to adjacent residential land uses in a neighbourhood-type zone in accordance with the following: a. for ground level private open space, the smaller of the following: i. half the existing ground level open space or ii. 35m2 of the existing ground level open space (with at least one of the area's dimensions measuring 2.5m) b. for ground level communal open space, at least half of the existing ground level open space.
PO 3.3 Development does not unduly reduce the generating capacity of adjacent rooftop solar energy facilities taking into account: (a) the form of development contemplated in the zone (b) the orientation of the solar energy facilities (c) the extent to which the solar energy facilities are already overshadowed.	DTS/DPF 3.3 None are applicable.
PO 3.4 Development that incorporates moving parts, including windmills and wind farms, are located and operated to not cause unreasonable nuisance to nearby dwellings and tourist accommodation caused by shadow flicker.	DTS/DPF 3.4 None are applicable.
Activities Generating Noise or Vibration	
PO 4.1 Development that emits noise (other than music) does not unreasonably impact the amenity of sensitive receivers (or lawfully approved sensitive receivers).	DTS/DPF 4.1 Noise that affects sensitive receivers achieves the relevant Environment Protection (Noise) Policy criteria.
PO 4.2 Areas for the on-site manoeuvring of service and delivery vehicles, plant and equipment, outdoor work spaces (and the like) are designed	DTS/DPF 4.2 None are applicable.

and sited to not unreasonably impact the amenity of adjacent sensitive receivers (or lawfully approved sensitive receivers) and zones primarily intended to accommodate sensitive receivers due to noise and vibration by adopting techniques including: (a) locating openings of buildings and associated services away from the interface with the adjacent sensitive receivers and zones primarily intended to accommodate sensitive receivers (b) when sited outdoors, locating such areas as far as practicable from adjacent sensitive receivers and zones primarily intended to accommodate sensitive receivers (c) housing plant and equipment within an enclosed structure or acoustic enclosure (d) providing a suitable acoustic barrier between the plant and / or equipment and the adjacent sensitive receiver boundary or zone.	
PO 4.3 Fixed plant and equipment in the form of pumps and/or filtration systems for a swimming pool or spa are positioned and/or housed to not cause unreasonable noise nuisance to adjacent sensitive receivers (or lawfully approved sensitive receivers).	DTS/DPF 4.3 The pump and/or filtration system ancillary to a dwelling erected on the same site is: (a) enclosed in a solid acoustic structure located at least 5m from the nearest habitable room located on an adjoining allotment or (b) located at least 12m from the nearest habitable room located on an adjoining allotment.
PO 4.4 External noise into bedrooms is minimised by separating or shielding these rooms from service equipment areas and fixed noise sources located on the same or an adjoining allotment.	DTS/DPF 4.4 Adjacent land is used for residential purposes.
PO 4.5 Outdoor areas associated with licensed premises (such as beer gardens or dining areas) are designed and/or sited to not cause unreasonable noise impact on existing adjacent sensitive receivers (or lawfully approved sensitive receivers).	DTS/DPF 4.5 None are applicable.
PO 4.6 Development incorporating music achieves suitable acoustic amenity when measured at the boundary of an adjacent sensitive receiver (or lawfully approved sensitive receiver) or zone primarily intended to accommodate sensitive receivers.	DTS/DPF 4.6 Development incorporating music includes noise attenuation measures that will achieve the following noise levels: **Assessment location** / **Music noise level** Externally at the nearest existing or envisaged noise sensitive location / Less than 8dB above the level of background noise ($L_{90,15min}$) in any octave band of the sound spectrum (LOCT10,15 < LOCT90,15 + 8dB)
Air Quality	
PO 5.1 Development with the potential to emit harmful or nuisance-generating air pollution incorporates air pollution control measures to prevent harm to human health or unreasonably impact the amenity of sensitive receivers (or lawfully approved sensitive receivers) within the locality and zones primarily intended to accommodate sensitive receivers.	DTS/DPF 5.1 None are applicable.
PO 5.2 Development that includes chimneys or exhaust flues (including cafes, restaurants and fast food outlets) is designed to minimise nuisance or adverse health impacts to sensitive receivers (or lawfully approved sensitive receivers) by:	DTS/DPF 5.2 None are applicable.

(a) incorporating appropriate treatment technology before exhaust emissions are released (b) locating and designing chimneys or exhaust flues to maximise the dispersion of exhaust emissions, taking into account the location of sensitive receivers.	
Light Spill	
PO 6.1 External lighting is positioned and designed to not cause unreasonable light spill impact on adjacent sensitive receivers (or lawfully approved sensitive receivers).	DTS/DPF 6.1 None are applicable.
PO 6.2 External lighting is not hazardous to motorists and cyclists.	DTS/DPF 6.2 None are applicable.
Solar Reflectivity / Glare	
PO 7.1 Development is designed and comprised of materials and finishes that do not unreasonably cause a distraction to adjacent road users and pedestrian areas or unreasonably cause heat loading and micro-climatic impacts on adjacent buildings and land uses as a result of reflective solar glare.	DTS/DPF 7.1 None are applicable.
Electrical Interference	
PO 8.1 Development in rural and remote areas does not unreasonably diminish or result in the loss of existing communication services due to electrical interference.	DTS/DPF 8.1 The building or structure: (a) is no greater than 10m in height, measured from existing ground level or (b) is not within a line of sight between a fixed transmitter and fixed receiver (antenna) other than where an alternative service is available via a different fixed transmitter or cable.
Interface with Rural Activities	
PO 9.1 Sensitive receivers are located and designed to mitigate impacts from lawfully existing horticultural and farming activities (or lawfully approved horticultural and farming activities), including spray drift and noise and do not prejudice the continued operation of these activities.	DTS/DPF 9.1 None are applicable.
PO 9.2 Sensitive receivers are located and designed to mitigate potential impacts from lawfully existing intensive animal husbandry activities and do not prejudice the continued operation of these activities.	DTS/DPF 9.2 None are applicable.
PO 9.3 Sensitive receivers are located and designed to mitigate potential impacts from lawfully existing land-based aquaculture activities and do not prejudice the continued operation of these activities.	DTS/DPF 9.3 Sensitive receivers are located at least 200m from the boundary of a site used for land-based aquaculture and associated components in other ownership.
PO 9.4 Sensitive receivers are located and designed to mitigate potential impacts from lawfully existing dairies including associated wastewater lagoons and liquid/solid waste storage and disposal facilities and do not prejudice the continued operation of these activities.	DTS/DPF 9.4 Sensitive receivers are sited at least 500m from the boundary of a site used for a dairy and associated wastewater lagoon(s) and liquid/solid waste storage and disposal facilities in other ownership.
PO 9.5 Sensitive receivers are located and designed to mitigate the potential impacts from lawfully existing facilities used for the handling, transportation and storage of bulk commodities (recognising the	DTS/DPF 9.5 Sensitive receivers are located away from the boundary of a site used for the handling, transportation and/or storage of bulk commodities in other ownership in accordance with the following:

potential for extended hours of operation) and do not prejudice the continued operation of these activities.	(a) 300m or more, where it involves the handling of agricultural crop products, rock, ores, minerals, petroleum products or chemicals to or from any commercial storage facility (b) 300m or more, where it involves the handling of agricultural crop products, rock, ores, minerals, petroleum products or chemicals at a wharf or wharf side facility (including sea-port grain terminals) where the handling of these materials into or from vessels does not exceed 100 tonnes per day (c) 500m or more, where it involves the storage of bulk petroleum in individual containers with a capacity up to 200 litres and a total on-site storage capacity not exceeding 1000 cubic metres (d) 500m or more, where it involves the handling of coal with a capacity up to 1 tonne per day or a storage capacity up to 50 tonnes (e) 1000m or more, where it involves the handling of coal with a capacity exceeding 1 tonne per day but not exceeding 100 tonnes per day or a storage capacity exceeding 50 tonnes but not exceeding 5000 tonnes.
PO 9.6 Setbacks and vegetation plantings along allotment boundaries should be incorporated to mitigate the potential impacts of spray drift and other impacts associated with agricultural and horticultural activities.	DTS/DPF 9.6 None are applicable.
PO 9.7 Urban development does not prejudice existing agricultural and horticultural activities through appropriate separation and design techniques.	DTS/DPF 9.7 None are applicable.
Interface with Mines and Quarries (Rural and Remote Areas)	
PO 10.1 Sensitive receivers are separated from existing mines to minimise the adverse impacts from noise, dust and vibration.	DTS/DPF 10.1 Sensitive receivers are located no closer than 500m from the boundary of a Mining Production Tenement under the *Mining Act 1971*.

Land Division

Assessment Provisions (AP)

Desired Outcome (DO)

Desired Outcome	
DO 1	Land division: (a) creates allotments with the appropriate dimensions and shape for their intended use (b) allows efficient provision of new infrastructure and the optimum use of underutilised infrastructure (c) integrates and allocates adequate and suitable land for the preservation of site features of value, including significant vegetation, watercourses, water bodies and other environmental features (d) facilitates solar access through allotment orientation (e) creates a compact urban form that supports active travel, walkability and the use of public transport (f) avoids areas of high natural hazard risk.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
All land division	

Allotment configuration	
PO 1.1 Land division creates allotments suitable for their intended use.	DTS/DPF 1.1 Division of land satisfies (a) or (b): (a) reflects the site boundaries illustrated and approved in an operative or existing development authorisation for residential development under the *Development Act 1993* or *Planning, Development and Infrastructure Act 2016* where the allotments are used or are proposed to be used solely for residential purposes (b) is proposed as part of a combined land division application with deemed-to-satisfy dwellings on the proposed allotments.
PO 1.2 Land division considers the physical characteristics of the land, preservation of environmental and cultural features of value and the prevailing context of the locality.	DTS/DPF 1.2 None are applicable.
Design and Layout	
PO 2.1 Land division results in a pattern of development that minimises the likelihood of future earthworks and retaining walls.	DTS/DPF 2.1 None are applicable.
PO 2.2 Land division enables the appropriate management of interface impacts between potentially conflicting land uses and/or zones.	DTS/DPF 2.2 None are applicable.
PO 2.3 Land division maximises the number of allotments that face public open space and public streets.	DTS/DPF 2.3 None are applicable.
PO 2.4 Land division is integrated with site features, adjacent land uses, the existing transport network and available infrastructure.	DTS/DPF 2.4 None are applicable.
PO 2.5 Development and infrastructure is provided and staged in a manner that supports an orderly and economic provision of land, infrastructure and services.	DTS/DPF 2.5 None are applicable.
PO 2.6 Land division results in watercourses being retained within open space and development taking place on land not subject to flooding.	DTS/DPF 2.6 None are applicable.
PO 2.7 Land division results in legible street patterns connected to the surrounding street network.	DTS/DPF 2.7 None are applicable.
PO 2.8 Land division is designed to preserve existing vegetation of value including native vegetation and regulated and significant trees.	DTS/DPF 2.8 None are applicable.
Roads and Access	
PO 3.1 Land division provides allotments with access to an all-weather public road.	DTS/DPF 3.1 None are applicable.
PO 3.2 Street patterns and intersections are designed to enable the safe and efficient movement of pedestrian, cycle and vehicular traffic.	DTS/DPF 3.2 None are applicable.
PO 3.3	DTS/DPF 3.3

Land division does not impede access to publicly owned open space and/or recreation facilities.	None are applicable.
PO 3.4 Road reserves provide for safe and convenient movement and parking of projected volumes of vehicles and allow for the efficient movement of service and emergency vehicles.	DTS/DPF 3.4 None are applicable.
PO 3.5 Road reserves are designed to accommodate pedestrian and cycling infrastructure, street tree planting, landscaping and street furniture.	DTS/DPF 3.5 None are applicable.
PO 3.6 Road reserves accommodate stormwater drainage and public utilities.	DTS/DPF 3.6 None are applicable.
PO 3.7 Road reserves provide unobstructed vehicular access and egress to and from individual allotments and sites.	DTS/DPF 3.7 None are applicable.
PO 3.8 Roads, open space and thoroughfares provide safe and convenient linkages to the surrounding open space and transport network.	DTS/DPF 3.8 None are applicable.
PO 3.9 Public streets are designed to enable tree planting to provide shade and enhance the amenity of streetscapes.	DTS/DPF 3.9 None are applicable.
PO 3.10 Local streets are designed to create low-speed environments that are safe for cyclists and pedestrians.	DTS/DPF 3.10 None are applicable.
Infrastructure	
PO 4.1 Land division incorporates public utility services within road reserves or dedicated easements.	DTS/DPF 4.1 None are applicable.
PO 4.2 Waste water, sewage and other effluent is capable of being disposed of from each allotment without risk to public health or the environment.	DTS/DPF 4.2 Each allotment can be connected to: (a) a waste water treatment plant that has the hydraulic volume and pollutant load treatment and disposal capacity for the maximum predicted wastewater volume generated by subsequent development of the proposed allotment or (b) a form of on-site waste water treatment and disposal that meets relevant public health and environmental standards.
PO 4.3 Septic tank effluent drainage fields and other waste water disposal areas are maintained to ensure the effective operation of waste systems and minimise risks to human health and the environment.	DTS/DPF 4.3 Development is not built on, or encroaches within, an area that is or will be, required for a sewerage system or waste control system.
PO 4.4 Constructed wetland systems, including associated detention and retention basins, are sited and designed to ensure public health and safety is protected, including by minimising potential public health risks arising from the breeding of mosquitoes.	DTS/DPF 4.4 None are applicable.
PO 4.5 Constructed wetland systems, including associated detention and retention basins, are sited and designed to allow sediments to settle prior to discharge into watercourses or the marine environment.	DTS/DPF 4.5 None are applicable.

PO 4.6 Constructed wetland systems, including associated detention and retention basins, are sited and designed to function as a landscape feature.	DTS/DPF 4.6 None are applicable.
Minor Land Division (Under 20 Allotments)	
Open Space	
PO 5.1 Land division proposing an additional allotment under 1 hectare provides or supports the provision of open space.	DTS/DPF 5.1 None are applicable.
Solar Orientation	
PO 6.1 Land division for residential purposes facilitates solar access through allotment orientation.	DTS/DPF 6.1 None are applicable.
Water Sensitive Design	
PO 7.1 Land division creating a new road or common driveway includes stormwater management systems that minimise the discharge of sediment, suspended solids, organic matter, nutrients, bacteria, litter and other contaminants to the stormwater system, watercourses or other water bodies.	DTS/DPF 7.1 None are applicable.
PO 7.2 Land division designed to mitigate peak flows and manage the rate and duration of stormwater discharges from the site to ensure that the development does not increase the peak flows in downstream systems.	DTS/DPF 7.2 None are applicable.
Battle-Axe Development	
PO 8.1 Battle-axe development appropriately responds to the existing neighbourhood context.	DTS/DPF 8.1 Allotments are not in the form of a battle-axe arrangement.
PO 8.2 Battle-axe development designed to allow safe and convenient movement.	DTS/DPF 8.2 The handle of a battle-axe development: (a) has a minimum width of 4m or (b) where more than 3 allotments are proposed, a minimum width of 5.5m.
PO 8.3 Battle-axe allotments and/or common land are of a suitable size and dimension to allow passenger vehicles to enter and exit and manoeuvre within the site in a safe and convenient manner.	DTS/DPF 8.3 Battle-axe development allows a B85 passenger vehicle to enter and exit parking spaces in no more than a three-point turn manoeuvre.
PO 8.4 Battle-axe or common driveways incorporate landscaping and permeability to improve appearance and assist in stormwater management.	DTS/DPF 8.4 Battle-axe or common driveways satisfy (a) and (b): (a) are constructed of a minimum of 50% permeable or porous material (b) where the driveway is located directly adjacent the side or rear boundary of the site, soft landscaping with a minimum dimension of 1m is provided between the driveway and site boundary (excluding along the perimeter of a passing point).
Major Land Division (20+ Allotments)	
Open Space	
PO 9.1 Land division allocates or retains evenly distributed, high quality areas	DTS/DPF 9.1 None are applicable.

of open space to improve residential amenity and provide urban heat amelioration.	
PO 9.2 Land allocated for open space is suitable for its intended active and passive recreational use considering gradient and potential for inundation.	DTS/DPF 9.2 None are applicable.
PO 9.3 Land allocated for active recreation has dimensions capable of accommodating a range of active recreational activities.	DTS/DPF 9.3 None are applicable.
Water Sensitive Design	
PO 10.1 Land division creating 20 or more allotments includes a stormwater management system designed to mitigate peak flows and manage the rate and duration of stormwater discharges from the site to ensure that the development does not increase the peak flows in downstream systems.	DTS/DPF 10.1 None are applicable.
PO 10.2 Land division creating 20 or more allotments includes stormwater management systems that minimise the discharge of sediment, suspended solids, organic matter, nutrients, bacteria, litter and other contaminants to the stormwater system, watercourses or other water bodies.	DTS/DPF 10.2 None are applicable.
Solar Orientation	
PO 11.1 Land division creating 20 or more allotments for residential purposes facilitates solar access through allotment orientation and allotment dimensions.	DTS/DPF 11.1 None are applicable.

Marinas and On-Water Structures

Assessment Provisions (AP)

Desired Outcome (DO)

Desired Outcome	
DO 1	Marinas and on-water structures are located and designed to minimise the impairment of commercial, recreational and navigational activities and adverse impacts on the environment.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
Navigation and Safety	
PO 1.1 Safe public access is provided or maintained to the waterfront, public infrastructure and recreation areas.	DTS/DPF 1.1 None are applicable.
PO 1.2	DTS/DPF 1.2

The operation of wharves is not impaired by marinas and on-water structures.	None are applicable.
PO 1.3 Navigation and access channels are not impaired by marinas and on-water structures.	DTS/DPF 1.3 None are applicable.
PO 1.4 Commercial shipping lanes are not impaired by marinas and on-water structures.	DTS/DPF 1.4 Marinas and on-water structures are set back 250m or more from commercial shipping lanes.
PO 1.5 Marinas and on-water structures are located to avoid interfering with the operation or function of a water supply pumping station.	DTS/DPF 1.5 On-water structures are set back: (a) 3km or more from upstream water supply pumping station take-off points (b) 500m or more from downstream water supply pumping station take-off points.
PO 1.6 Maintenance of on-water infrastructure, including revetment walls, is not impaired by marinas and on-water structures.	DTS/DPF 1.6 None are applicable.
Environmental Protection	
PO 2.1 Development is sited and designed to facilitate water circulation and exchange.	DTS/DPF 2.1 None are applicable.

Open Space and Recreation

Assessment Provisions (AP)

Desired Outcome (DO)

	Desired Outcome
DO 1	Pleasant, functional and accessible open space and recreation facilities are provided at State, regional, district, neighbourhood and local levels for active and passive recreation, biodiversity, community health, urban cooling, tree canopy cover, visual amenity, gathering spaces, wildlife and waterway corridors, and a range of other functions and at a range of sizes that reflect the purpose of that open space.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
Land Use and Intensity	
PO 1.1 Recreation facilities are compatible with surrounding land uses and activities.	DTS/DPF 1.1 None are applicable.
PO 1.2 Open space areas include natural or landscaped areas using locally indigenous plant species and large trees.	DTS/DPF 1.2 None are applicable.
Design and Siting	

PO 2.1 Open space and recreation facilities address adjacent public roads to optimise pedestrian access and visibility.	DTS/DPF 2.1 None are applicable.
PO 2.2 Open space and recreation facilities incorporate park furniture, shaded areas and resting places.	DTS/DPF 2.2 None are applicable.
PO 2.3 Open space and recreation facilities link habitats, wildlife corridors and existing open spaces and recreation facilities.	DTS/DPF 2.3 None are applicable.
Pedestrians and Cyclists	
PO 3.1 Open space incorporates: (a) pedestrian and cycle linkages to other open spaces, centres, schools and public transport nodes; (b) safe crossing points where pedestrian routes intersect the road network; (c) easily identified access points.	DTS/DPF 3.1 None are applicable.
Usability	
PO 4.1 Land allocated for open space is suitable for its intended active and passive recreational use taking into consideration its gradient and potential for inundation.	DTS/DPF 4.1 None are applicable.
Safety and Security	
PO 5.1 Open space is overlooked by housing, commercial or other development to provide casual surveillance where possible.	DTS/DPF 5.1 None are applicable.
PO 5.2 Play equipment is located to maximise opportunities for passive surveillance.	DTS/DPF 5.2 None are applicable.
PO 5.3 Landscaping provided in open space and recreation facilities maximises opportunities for casual surveillance throughout the park.	DTS/DPF 5.3 None are applicable.
PO 5.4 Fenced parks and playgrounds have more than one entrance or exit to minimise potential entrapment.	DTS/DPF 5.4 None are applicable.
PO 5.5 Adequate lighting is provided around toilets, telephones, seating, litter bins, bicycle storage, car parks and other such facilities.	DTS/DPF 5.5 None are applicable.
PO 5.6 Pedestrian and bicycle movement after dark is focused along clearly defined, adequately lit routes with observable entries and exits.	DTS/DPF 5.6 None are applicable.
Signage	
PO 6.1 Signage is provided at entrances to and within the open space and recreation facilities to provide clear orientation to major points of interest such as the location of public toilets, telephones, safe routes, park activities and the like.	DTS/DPF 6.1 None are applicable.
Buildings and Structures	

PO 7.1 Buildings and car parking areas in open space areas are designed, located and of a scale to be unobtrusive.	DTS/DPF 7.1 None are applicable.
PO 7.2 Buildings and structures in open space areas are clustered where practical to ensure that the majority of the site remains open.	DTS/DPF 7.2 None are applicable.
PO 7.3 Development in open space is constructed to minimise the extent of impervious surfaces.	DTS/DPF 7.3 None are applicable.
PO 7.4 Development that abuts or includes a coastal reserve or Crown land used for scenic, conservation or recreational purposes is located and designed to have regard to the purpose, management and amenity of the reserve.	DTS/DPF 7.4 None are applicable.
Landscaping	
PO 8.1 Open space and recreation facilities provide for the planting and retention of large trees and vegetation.	DTS/DPF 8.1 None are applicable.
PO 8.2 Landscaping in open space and recreation facilities provides shade and windbreaks: (a) along cyclist and pedestrian routes; (b) around picnic and barbecue areas; (c) in car parking areas.	DTS/DPF 8.2 None are applicable.
PO 8.3 Landscaping in open space facilitates habitat for local fauna and facilitates biodiversity.	DTS/DPF 8.3 None are applicable.
PO 8.4 Landscaping including trees and other vegetation passively watered with local rainfall run-off, where practicable.	DTS/DPF 8.4 None are applicable.

Out of Activity Centre Development

Assessment Provisions (AP)

Desired Outcome (DO)

Desired Outcome	
DO1	The role of Activity Centres in contributing to the form and pattern of development and enabling equitable and convenient access to a range of shopping, administrative, cultural, entertainment and other facilities in a single trip is maintained and reinforced.

Performance Outcomes and Deemed to Satisfy / Designated Performance Outcome Criteria

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
PO 1.1 Non-residential development outside Activity Centres of a scale and type that does not diminish the role of Activity Centres: (a) as primary locations for shopping, administrative, cultural, entertainment and community services (b) as a focus for regular social and business gatherings	DTS/DPF 1.1 None are applicable.

(c) in contributing to or maintaining a pattern of development that supports equitable community access to services and facilities.	
PO 1.2 Out-of-activity centre non-residential development complements Activity Centres through the provision of services and facilities: (a) that support the needs of local residents and workers, particularly in underserviced locations (b) at the edge of Activities Centres where they cannot readily be accommodated within an existing Activity Centre to expand the range of services on offer and support the role of the Activity Centre.	DTS/DPF 1.2 None are applicable.

Resource Extraction

Assessment Provisions (AP)

Desired Outcome (DO)

Desired Outcome	
DO 1	Resource extraction activities are developed in a manner that minimises human and environmental impacts.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
Land Use and Intensity	
PO 1.1 Resource extraction activities minimise landscape damage outside of those areas unavoidably disturbed to access and exploit a resource and provide for the progressive reclamation and betterment of disturbed areas.	DTS/DPF 1.1 None are applicable.
PO 1.2 Resource extraction activities avoid damage to cultural sites or artefacts.	DTS/DPF 1.2 None are applicable.
Water Quality	
PO 2.1 Stormwater and/or wastewater from resource extraction activities is diverted into appropriately sized treatment and retention systems to enable reuse on site.	DTS/DPF 2.1 None are applicable.
Separation Treatments, Buffers and Landscaping	
PO 3.1 Resource extraction activities minimise adverse impacts upon sensitive receivers through incorporation of separation distances and/or mounding/vegetation.	DTS/DPF 3.1 None are applicable.
PO 3.2 Resource extraction activities are screened from view from adjacent	DTS/DPF 3.2 None are applicable.

land by perimeter landscaping and/or mounding.	

Site Contamination

Assessment Provisions (AP)

Desired Outcome (DO)

Desired Outcome	
DO 1	Ensure land is suitable for the proposed use in circumstances where it is, or may have been, subject to site contamination.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
PO 1.1 Ensure land is suitable for use when land use changes to a more sensitive use.	DTS/DPF 1.1 Development satisfies (a), (b), (c) or (d): (a) does not involve a change in the use of land (b) involves a change in the use of land that does not constitute a change to a more sensitive use (c) involves a change in the use of land to a more sensitive use on land at which site contamination is unlikely to exist (as demonstrated in a site contamination declaration form) (d) involves a change in the use of land to a more sensitive use on land at which site contamination exists, or may exist (as demonstrated in a site contamination declaration form), and satisfies both of the following: (i) a site contamination audit report has been prepared under Part 10A of the *Environment Protection Act 1993* in relation to the land within the previous 5 years which states that- A. site contamination does not exist (or no longer exists) at the land or B. the land is suitable for the proposed use or range of uses (without the need for any further remediation) or C. where remediation is, or remains, necessary for the proposed use (or range of uses), remediation work has been carried out or will be carried out (and the applicant has provided a written undertaking that the remediation works will be implemented in association with the development) and (ii) no other class 1 activity or class 2 activity has taken place at the land since the preparation of the site contamination audit report (as demonstrated in a site contamination declaration form).

Tourism Development

Assessment Provisions (AP)

Desired Outcome (DO)

Desired Outcome	
DO 1	Tourism development is built in locations that cater to the needs of visitors and positively contributes to South Australia's visitor economy.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
General	
PO 1.1 Tourism development complements and contributes to local, natural, cultural or historical context where: (a) it supports immersive natural experiences (b) it showcases South Australia's landscapes and produce (c) its events and functions are connected to local food, wine and nature.	DTS/DPF 1.1 None are applicable.
PO 1.2 Tourism development comprising multiple accommodation units (including any facilities and activities for use by guests and visitors) is clustered to minimise environmental and contextual impact.	DTS/DPF 1.2 None are applicable.
Caravan and Tourist Parks	
PO 2.1 Potential conflicts between long-term residents and short-term tourists are minimised through suitable siting and design measures.	DTS/DPF 2.1 None are applicable.
PO 2.2 Occupants are provided privacy and amenity through landscaping and fencing.	DTS/DPF 2.2 None are applicable.
PO 2.3 Communal open space and centrally located recreation facilities are provided for guests and visitors.	DTS/DPF 2.3 12.5% or more of a caravan park comprises clearly defined communal open space, landscaped areas and areas for recreation.
PO 2.4 Perimeter landscaping is used to enhance the amenity of the locality.	DTS/DPF 2.4 None are applicable.
PO 2.5 Amenity blocks (showers, toilets, laundry and kitchen facilities) are sufficient to serve the full occupancy of the development.	DTS/DPF 2.5 None are applicable.
PO 2.6 Long-term occupation does not displace tourist accommodation, particularly in important tourist destinations such as coastal and riverine locations.	DTS/DPF 2.6 None are applicable.
Tourist accommodation in areas constituted under the National Parks and Wildlife Act 1972	
PO 3.1 Tourist accommodation avoids delicate or environmentally sensitive areas such as sand dunes, cliff tops, estuaries, wetlands or substantially intact strata of native vegetation (including regenerated areas of native	DTS/DPF 3.1 None are applicable.

vegetation lost through bushfire).	
PO 3.2 Tourist accommodation is sited and designed in a manner that is subservient to the natural environment and where adverse impacts on natural features, landscapes, habitats and cultural assets are avoided.	DTS/DPF 3.2 None are applicable.
PO 3.3 Tourist accommodation and recreational facilities, including associated access ways and ancillary structures, are located on cleared (other than where cleared as a result of bushfire) or degraded areas or where environmental improvements can be achieved.	DTS/DPF 3.3 None are applicable.
PO 3.4 Tourist accommodation is designed to prevent conversion to private dwellings through: (a) comprising a minimum of 10 accommodation units (b) clustering separated individual accommodation units (c) being of a size unsuitable for a private dwelling (d) ensuring functional areas that are generally associated with a private dwelling such as kitchens and laundries are excluded from, or physically separated from individual accommodation units, or are of a size unsuitable for a private dwelling.	DTS/DPF 3.4 None are applicable.

Transport, Access and Parking

Assessment Provisions (AP)

Desired Outcome (DO)

Desired Outcome	
DO 1	A comprehensive, integrated and connected transport system that is safe, sustainable, efficient, convenient and accessible to all users.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
Movement Systems	
PO 1.1 Development is integrated with the existing transport system and designed to minimise its potential impact on the functional performance of the transport system.	DTS/DPF 1.1 None are applicable.
PO 1.2 Development is designed to discourage commercial and industrial vehicle movements through residential streets and adjacent other sensitive receivers.	DTS/DPF 1.2 None are applicable.
PO 1.3 Industrial, commercial and service vehicle movements, loading areas and designated parking spaces are separated from passenger vehicle car parking areas to ensure efficient and safe movement and minimise	DTS/DPF 1.3 None are applicable.

potential conflict.	
PO 1.4 Development is sited and designed so that loading, unloading and turning of all traffic avoids interrupting the operation of and queuing on public roads and pedestrian paths.	DTS/DPF 1.4 All vehicle manoeuvring occurs onsite.
Sightlines	
PO 2.1 Sightlines at intersections, pedestrian and cycle crossings, and crossovers to allotments for motorists, cyclists and pedestrians are maintained or enhanced to ensure safety for all road users and pedestrians.	DTS/DPF 2.1 None are applicable.
PO 2.2 Walls, fencing and landscaping adjacent to driveways and corner sites are designed to provide adequate sightlines between vehicles and pedestrians.	DTS/DPF 2.2 None are applicable.
Vehicle Access	
PO 3.1 Safe and convenient access minimises impact or interruption on the operation of public roads.	DTS/DPF 3.1 The access is: (a) provided via a lawfully existing or authorised driveway or access point or an access point for which consent has been granted as part of an application for the division of land or (b) not located within 6m of an intersection of 2 or more roads or a pedestrian activated crossing.
PO 3.2 Development incorporating vehicular access ramps ensures vehicles can enter and exit a site safely and without creating a hazard to pedestrians and other vehicular traffic.	DTS/DPF 3.2 None are applicable.
PO 3.3 Access points are sited and designed to accommodate the type and volume of traffic likely to be generated by the development or land use.	DTS/DPF 3.3 None are applicable.
PO 3.4 Access points are sited and designed to minimise any adverse impacts on neighbouring properties.	DTS/DPF 3.4 None are applicable.
PO 3.5 Access points are located so as not to interfere with street trees, existing street furniture (including directional signs, lighting, seating and weather shelters) or infrastructure services to maintain the appearance of the streetscape, preserve local amenity and minimise disruption to utility infrastructure assets.	DTS/DPF 3.5 Vehicle access to designated car parking spaces satisfy (a) or (b): (a) is provided via a lawfully existing or authorised access point or an access point for which consent has been granted as part of an application for the division of land (b) where newly proposed, is set back: (i) 0.5m or more from any street furniture, street pole, infrastructure services pit, or other stormwater or utility infrastructure unless consent is provided from the asset owner (ii) 2m or more from the base of the trunk of a street tree unless consent is provided from the tree owner for a lesser distance (iii) 6m or more from the tangent point of an intersection of 2 or more roads (iv) outside of the marked lines or infrastructure dedicating a pedestrian crossing.
PO 3.6	DTS/DPF 3.6

Driveways and access points are separated and minimised in number to optimise the provision of on-street visitor parking (where on-street parking is appropriate).	Driveways and access points: (a) for sites with a frontage to a public road of 20m or less, one access point no greater than 3.5m in width is provided (b) for sites with a frontage to a public road greater than 20m: (i) a single access point no greater than 6m in width is provided or (ii) not more than two access points with a width of 3.5m each are provided.
PO 3.7 Access points are appropriately separated from level crossings to avoid interference and ensure their safe ongoing operation.	DTS/DPF 3.7 Development does not involve a new or modified access or cause an increase in traffic through an existing access that is located within the following distance from a railway crossing: (a) 80 km/h road - 110m (b) 70 km/h road - 90m (c) 60 km/h road - 70m (d) 50km/h or less road - 50m.
PO 3.8 Driveways, access points, access tracks and parking areas are designed and constructed to allow adequate movement and manoeuvrability having regard to the types of vehicles that are reasonably anticipated.	DTS/DPF 3.8 None are applicable.
PO 3.9 Development is designed to ensure vehicle circulation between activity areas occurs within the site without the need to use public roads.	DTS/DPF 3.9 None are applicable.
Access for People with Disabilities	
PO 4.1 Development is sited and designed to provide safe, dignified and convenient access for people with a disability.	DTS/DPF 4.1 None are applicable.
Vehicle Parking Rates	
PO 5.1 Sufficient on-site vehicle parking and specifically marked accessible car parking places are provided to meet the needs of the development or land use having regard to factors that may support a reduced on-site rate such as: (a) availability of on-street car parking (b) shared use of other parking areas (c) in relation to a mixed-use development, where the hours of operation of commercial activities complement the residential use of the site, the provision of vehicle parking may be shared (d) the adaptive reuse of a State or Local Heritage Place.	DTS/DPF 5.1 Development provides a number of car parking spaces on-site at a rate no less than the amount calculated using one of the following, whichever is relevant: (a) Transport, Access and Parking Table 2 - Off-Street Vehicle Parking Requirements in Designated Areas if the development is a class of development listed in Table 2 and the site is in a Designated Area (b) Transport, Access and Parking Table 1 - General Off-Street Car Parking Requirements where (a) does not apply (c) if located in an area where a lawfully established carparking fund operates, the number of spaces calculated under (a) or (b) less the number of spaces offset by contribution to the fund.
Vehicle Parking Areas	
PO 6.1 Vehicle parking areas are sited and designed to minimise impact on the operation of public roads by avoiding the use of public roads when moving from one part of a parking area to another.	DTS/DPF 6.1 Movement between vehicle parking areas within the site can occur without the need to use a public road.
PO 6.2 Vehicle parking areas are appropriately located, designed and constructed to minimise impacts on adjacent sensitive receivers through measures such as ensuring they are attractively developed	DTS/DPF 6.2 None are applicable.

and landscaped, screen fenced, and the like.	
PO 6.3 Vehicle parking areas are designed to provide opportunity for integration and shared-use of adjacent car parking areas to reduce the total extent of vehicle parking areas and access points.	DTS/DPF 6.3 None are applicable.
PO 6.4 Pedestrian linkages between parking areas and the development are provided and are safe and convenient.	DTS/DPF 6.4 None are applicable.
PO 6.5 Vehicle parking areas that are likely to be used during non-daylight hours are provided with sufficient lighting to entry and exit points to ensure clear visibility to users.	DTS/DPF 6.5 None are applicable.
PO 6.6 Loading areas and designated parking spaces for service vehicles are provided within the boundary of the site.	DTS/DPF 6.6 Loading areas and designated parking spaces are wholly located within the site.
PO 6.7 On-site visitor parking spaces are sited and designed to be accessible to all visitors at all times.	DTS/DPF 6.7 None are applicable.
Undercroft and Below Ground Garaging and Parking of Vehicles	
PO 7.1 Undercroft and below ground garaging of vehicles is designed to enable safe entry and exit from the site without compromising pedestrian or cyclist safety or causing conflict with other vehicles.	DTS/DPF 7.1 None are applicable.
Internal Roads and Parking Areas in Residential Parks and Caravan and Tourist Parks	
PO 8.1 Internal road and vehicle parking areas are surfaced to prevent dust becoming a nuisance to park residents and occupants.	DTS/DPF 8.1 None are applicable.
PO 8.2 Traffic circulation and movement within the park is pedestrian friendly and promotes low speed vehicle movement.	DTS/DPF 8.2 None are applicable.
Bicycle Parking in Designated Areas	
PO 9.1 The provision of adequately sized on-site bicycle parking facilities encourages cycling as an active transport mode.	DTS/DPF 9.1 Areas and / or fixtures are provided for the parking and storage of bicycles at a rate not less than the amount calculated using Transport, Access and Parking Table 3 - Off Street Bicycle Parking Requirements.
PO 9.2 Bicycle parking facilities provide for the secure storage and tethering of bicycles in a place where casual surveillance is possible, is well lit and signed for the safety and convenience of cyclists and deters property theft.	DTS/DPF 9.2 None are applicable.
PO 9.3 Non-residential development incorporates end-of-journey facilities for employees such as showers, changing facilities and secure lockers, and signage indicating the location of the facilities to encourage cycling as a mode of journey-to-work transport.	DTS/DPF 9.3 None are applicable.
Corner Cut-Offs	
PO 10.1	DTS/DPF 10.1

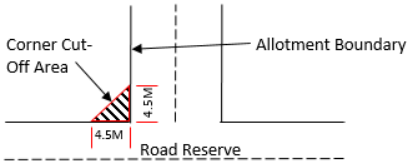
Development is located and designed to ensure drivers can safely turn into and out of public road junctions.	Development does not involve building work, or building work is located wholly outside the land shown as Corner Cut-Off Area in the following diagram: 
Heavy Vehicle Parking	
PO 11.1 Heavy vehicle parking and access is designed and sited so that the activity does not result in nuisance to adjoining neighbours as a result of dust, fumes, vibration, odour or potentially hazardous loads.	DTS/DPF 11.1 Heavy vehicle parking occurs in accordance with the following: (a) the site is not located within a Neighbourhood-type zone (except a Rural Living Zone) (b) the site is a minimum of 0.4 ha (c) where the site is 2 ha or more, no more than 2 vehicles exceeding 3,000 kilograms each (and trailers) are to be parked on the allotment at any time (d) where the site is between 0.4 ha and 2 ha, only one vehicle exceeding 3,000 kilograms (and one trailer) are to be parking on the allotment at any time (e) the vehicle parking area achieves the following setbacks: (i) behind the building line or 30m, whichever is greater (ii) 20m from the secondary street if it is a State Maintained Road (iii) 10m from the secondary street if it is a local road (iv) 10m from side and rear boundaries (f) parking and access areas (including internal driveways) should be sealed or have a surface that can be treated and maintained to minimise dust and mud nuisance (g) does not include refrigerated trailers or vehicles (h) vehicles only enter and exit the property in accordance with the following hours: (i) Monday to Saturday 6:00am and 9:30pm (ii) Sunday and public holidays between 9:30 am and 7:00 pm (i) the handling or trans-shipment of freight is not carried out on the property.
PO 11.2 Heavy vehicle parking ensures that vehicles can enter and exit a site safely and without creating a hazard to pedestrians and other vehicular traffic.	DTS/DPF 11.2 Heavy vehicles: (a) can enter and exit the site in a forward direction; and (b) operate within the statutory mass and dimension limited for General Access Vehicles (as prescribed by the National Heavy Vehicle Regulator).
PO 11.3 Heavy vehicle parking is screened through siting behind buildings, screening, landscaping or the like to obscure views from adjoining properties and public roads.	DTS/DPF 11.3 None are applicable.

Table 1 - General Off-Street Car Parking Requirements

The following parking rates apply and if located in an area where a lawfully established carparking fund operates, the number of spaces is reduced by an amount equal to the number of spaces offset by contribution to the fund.

Class of Development	Car Parking Rate (unless varied by Table 2 onwards) Where a development comprises more than one development type, then the overall car parking rate will be taken to be the sum of the car parking rates for each development type.
Residential Development	
Detached Dwelling	Dwelling with 1 bedroom (including rooms capable of being used as a bedroom) - 1 space per dwelling. Dwelling with 2 or more bedrooms (including rooms capable of being used as a bedroom) - 2 spaces per dwelling, 1 of which is to be covered.
Group Dwelling	Dwelling with 1 or 2 bedrooms (including rooms capable of being used as a bedroom) - 1 space per dwelling. Dwelling with 3 or more bedrooms (including rooms capable of being used as a bedroom) - 2 spaces per dwelling, 1 of which is to be covered. 0.33 spaces per dwelling for visitor parking where development involves 3 or more dwellings.
Residential Flat Building	Dwelling with 1 or 2 bedrooms (including rooms capable of being used as a bedroom) - 1 space per dwelling. Dwelling with 3 or more bedrooms (including rooms capable of being used as a bedroom) - 2 spaces per dwelling, 1 of which is to be covered. 0.33 spaces per dwelling for visitor parking where development involves 3 or more dwellings.
Row Dwelling where vehicle access is from the primary street	Dwelling with 1 bedroom (including rooms capable of being used as a bedroom) - 1 space per dwelling. Dwelling with 2 or more bedrooms (including rooms capable of being used as a bedroom) - 2 spaces per dwelling, 1 of which is to be covered.
Row Dwelling where vehicle access is not from the primary street (i.e. rear-loaded)	Dwelling with 1 or 2 bedrooms (including rooms capable of being used as a bedroom) - 1 space per dwelling. Dwelling with 3 or more bedrooms (including rooms capable of being used as a bedroom) - 2 spaces per dwelling, 1 of which is to be covered.
Semi-Detached Dwelling	Dwelling with 1 bedroom (including rooms capable of being used as a bedroom) - 1 space per dwelling. Dwelling with 2 or more bedrooms (including rooms capable of being used as a bedroom) - 2 spaces per dwelling, 1 of which is to be covered.
Aged / Supported Accommodation	
Retirement facility	Dwelling with 1 or 2 bedrooms (including rooms capable of being used as a bedroom) - 1 space per dwelling. Dwelling with 3 or more bedrooms (including rooms capable of being used as a bedroom) - 2 spaces per dwelling. 0.2 spaces per dwelling for visitor parking.
Supported accommodation	0.3 spaces per bed.
Residential Development (Other)	
Ancillary accommodation	No additional requirements beyond those associated with the main dwelling.
Residential park	Dwelling with 1 or 2 bedrooms (including rooms capable of being used as a bedroom) - 1 space per dwelling. Dwelling with 3 or more bedrooms (including rooms capable of being used as a bedroom) - 2 spaces per dwelling. 0.2 spaces per dwelling for visitor parking.
Student accommodation	0.3 spaces per bed.
Workers' accommodation	0.5 spaces per bed plus 0.2 spaces per bed for visitor parking.
Tourist	
Caravan and tourist park	Parks with 100 sites or less - a minimum of 1 space per 10 sites to be used for accommodation. Parks with more than 100 sites - a minimum of 1 space per 15 sites used for accommodation. A minimum of 1 space for every caravan (permanently fixed to the ground) or cabin.
Tourist accommodation other than a caravan and tourist park	1 car parking space per accommodation unit / guest room.
Commercial Uses	

Auction room/ depot	1 space per 100m2 of building floor area plus an additional 2 spaces.
Automotive collision repair	3 spaces per service bay.
Motor repair station	3 spaces per service bay.
Office	For a call centre, 8 spaces per 100m2 of gross leasable floor area In all other cases, 4 spaces per 100m2 of gross leasable floor area.
Retail fuel outlet	3 spaces per 100m2 gross leasable floor area.
Service trade premises	2.5 spaces per 100m2 of gross leasable floor area 1 space per 100m2 of outdoor area used for display purposes.
Shop (no commercial kitchen)	5.5 spaces per 100m2 of gross leasable floor area where not located in an integrated complex containing two or more tenancies (and which may comprise more than one building) where facilities for off-street vehicle parking, vehicle loading and unloading, and the storage and collection of refuse are shared. 5 spaces per 100m2 of gross leasable floor area where located in an integrated complex containing two or more tenancies (and which may comprise more than one building) where facilities for off-street vehicle parking, vehicle loading and unloading, and the storage and collection of refuse are shared.
Shop (in the form of a bulky goods outlet)	2.5 spaces per 100m2 of gross leasable floor area.
Shop (in the form of a restaurant or involving a commercial kitchen)	Premises with a dine-in service only (which may include a take-away component with no drive-through) - 0.4 spaces per seat. Premises with take-away service but with no seats - 12 spaces per 100m2 of total floor area plus a drive-through queue capacity of ten vehicles measured from the pick-up point. Premises with a dine-in and drive-through take-away service - 0.3 spaces per seat plus a drive through queue capacity of 10 vehicles measured from the pick-up point.
Community and Civic Uses	
Community facility	For a library, 4 spaces per 100m2 of total floor area. For a hall/meeting hall, 0.2 spaces per seat. In all other cases, 10 spaces per 100m2 of total floor area.
Educational facility	For a primary school - 1.1 space per full time equivalent employee plus 0.25 spaces per student for a pickup/set down area either on-site or on the public realm within 300m of the site. For a secondary school - 1.1 per full time equivalent employee plus 0.1 spaces per student for a pickup/set down area either on-site or on the public realm within 300m of the site. For a tertiary institution - 0.4 per student based on the maximum number of students on the site at any time.
Place of worship	1 space for every 3 visitor seats.
Child care facility	For a child care centre, 0.25 spaces per child In all other cases, 1 per employee plus 0.25 per child (drop off/pick up bays).
Health Related Uses	
Consulting room	4 spaces per consulting room excluding ancillary facilities.
Hospital	4.5 spaces per bed for a public hospital. 1.5 spaces per bed for a private hospital.
Recreational and Entertainment Uses	
Cinema complex	0.2 spaces per seat.
Concert hall / theatre	0.2 spaces per seat.
Hotel	1 space for every 2m2 of total floor area in a public bar plus 1 space for every 6m2 of total floor area available to the public in a lounge, beer garden plus 1 space per 2 gaming machines, plus 1 space per 3 seats in a restaurant.
Indoor recreation facility	6.5 spaces per 100m2 of total floor area for a Fitness Centre 4.5 spaces per 100m2 of total floor area for all other Indoor recreation facilities.

Industry/Employment Uses	
Fuel depot	1.5 spaces per 100m2 total floor area 1 spaces per 100m2 of outdoor area used for fuel depot activity purposes.
Industry	1.5 spaces per 100m2 of total floor area.
Store	0.5 spaces per 100m2 of total floor area.
Timber yard	1.5 spaces per 100m2 of total floor area 1 space per 100m2 of outdoor area used for display purposes.
Warehouse	0.5 spaces per 100m2 total floor area.
Other Uses	
Funeral Parlour	1 space per 5 seats in the chapel plus 1 space for each vehicle operated by the parlour.
Radio or Television Station	5 spaces per 100m2 of total building floor area.

Table 2 - Off-Street Car Parking Requirements in Designated Areas

The following parking rates apply in any zone, subzone or other area described in the 'Designated Areas' column.

Class of Development	Car Parking Rate Where a development comprises more than one development type, then the overall car parking rate will be taken to be the sum of the car parking rates for each development type.		Designated Areas
	Minimum number of spaces	Maximum number of spaces	
Development generally			
All classes of development	No minimum.	No maximum except in the Primary Pedestrian Area identified in the Primary Pedestrian Area Concept Plan, where the maximum is: 1 space for each dwelling with a total floor area less than 75 square metres 2 spaces for each dwelling with a total floor area between 75 square metres and 150 square metres 3 spaces for each dwelling with a total floor area greater than 150 square metres. Residential flat building or Residential component of a multi-storey building: 1 visitor space for each 6 dwellings.	Capital City Zone City Main Street Zone City Riverbank Zone Adelaide Park Lands Zone Business Neighbourhood Zone (within the City of Adelaide) The St Andrews Hospital Precinct Subzone and Women's and Children's Hospital Precinct Subzone of the Community Facilities Zone
Non-residential development			
Non-residential development excluding tourist accommodation	3 spaces per 100m2 of gross leasable floor area.	5 spaces per 100m2 of gross leasable floor area.	City Living Zone Urban Corridor (Boulevard) Zone Urban Corridor (Business) Zone Urban Corridor (Living) Zone Urban Corridor (Main Street) Zone Urban Neighbourhood Zone (except for Bowden)
Non-residential development excluding tourist accommodation	3 spaces per 100m2 of gross leasable floor area.	6 spaces per 100m2 of gross leasable floor area.	Strategic Innovation Zone in the City of Burnside, City of Marion or City of Mitcham Strategic Innovation Zone outside the City of Burnside, City of Marion or City of Mitcham when the site is also in a high frequency public transit area

			Suburban Activity Centre Zone when the site is also in a high frequency public transit area Suburban Business Zone when the site is also in a high frequency public transit area Business Neighbourhood Zone outside of the City of Adelaide when the site is also in a high frequency public transit area Suburban Main Street Zone when the site is also in a high frequency public transit area Urban Activity Centre Zone
Non-residential development excluding tourist accommodation	3 spaces per 100 square metres of gross leasable floor area 1.5 spaces per 100 square metres of gross leasable floor area above ground floor level other than for a shop	3 spaces per 100 square metres of gross leasable floor area	Urban Neighbourhood Zone in Bowden
Tourist accommodation	1 space for every 4 bedrooms up to 100 bedrooms plus 1 space for every 5 bedrooms over 100 bedrooms	1 space per 2 bedrooms up to 100 bedrooms and 1 space per 4 bedrooms over 100 bedrooms	City Living Zone Urban Activity Centre Zone when the site is also in a high frequency public transit area Urban Corridor (Boulevard) Zone Urban Corridor (Business) Zone Urban Corridor (Living) Zone Urban Corridor (Main Street) Zone Urban Neighbourhood Zone (except for Bowden)
Residential development			
Residential component of a multi-storey building	Dwelling with no separate bedroom -0.25 spaces per dwelling 1 bedroom dwelling - 0.75 spaces per dwelling 2 bedroom dwelling - 1 space per dwelling 3 or more bedroom dwelling - 1.25 spaces per dwelling 0.25 spaces per dwelling for visitor parking.	None specified.	City Living Zone Strategic Innovation Zone in the City of Burnside, City of Marion or City of Mitcham Strategic Innovation Zone outside the City of Burnside, City of Marion or City of Mitcham when the site is also in a high frequency public transit area Urban Activity Centre Zone when the site is also in a high frequency public transit area Urban Corridor (Boulevard) Zone Urban Corridor (Business) Zone Urban Corridor (Living) Zone

			Urban Corridor (Main Street) Zone Urban Neighbourhood Zone (except for Bowden)
Residential component of a multi-storey building	0.75 per dwelling	None specified	Urban Neighbourhood Zone in Bowden
Residential flat building	Dwelling with no separate bedroom -0.25 spaces per dwelling 1 bedroom dwelling - 0.75 spaces per dwelling 2 bedroom dwelling - 1 space per dwelling 3 or more bedroom dwelling - 1.25 spaces per dwelling 0.25 spaces per dwelling for visitor parking.	None specified.	City Living Zone Urban Activity Centre Zone when the site is also in a high frequency public transit area Urban Corridor (Boulevard) Zone Urban Corridor (Business) Zone Urban Corridor (Living) Zone Urban Corridor (Main Street) Zone Urban Neighbourhood Zone (except for Bowden)
Residential flat building	0.75 per dwelling	None specified	Urban Neighbourhood Zone in Bowden
Detached dwelling	0.75 per dwelling	None specified	Urban Neighbourhood Zone in Bowden
Row dwelling	0.75 per dwelling	None specified	Urban Neighbourhood Zone in Bowden
Semi-detached dwelling	0.75 per dwelling	None specified	Urban Neighbourhood Zone in Bowden

Table 3 - Off-Street Bicycle Parking Requirements

The bicycle parking rates apply within designated areas located within parts of the State identified in the Schedule to Table 3.

Class of Development	Bicycle Parking Rate Where a development comprises more than one development type, then the overall bicycle parking rate will be taken to be the sum of the bicycle parking rates for each development type.
Consulting room	1 space per 20 employees plus 1 space per 20 consulting rooms for customers.
Educational facility	For a secondary school - 1 space per 20 full-time time employees plus 10 percent of the total number of employee spaces for visitors. For tertiary education - 1 space per 20 employees plus 1 space per 10 full time students.
Hospital	1 space per 15 beds plus 1 space per 30 beds for visitors.
Indoor recreation facility	1 space per 4 employees plus 1 space per 200m2 of gross leasable floor area for visitors.
Licensed Premises	1 per 20 employees, plus 1 per 60 square metres total floor area, plus 1 per 40 square metres of bar floor area, plus 1 per 120 square metres lounge and beer garden floor area, plus 1 per 60 square metres dining floor area, plus 1 per 40 square metres gaming room floor area.
Office	1 space for every 200m2 of gross leasable floor area plus 2 spaces plus 1 space per 1000m2 of gross leasable floor area for visitors.
Child care facility	1 space per 20 full time employees plus 1 space per 40 full time children.
Recreation area	1 per 1500 spectator seats for employees plus 1 per 250 visitor and customers.
Residential flat building	Within the City of Adelaide 1 for every dwelling for residents with a total floor area less than 150 square metres, 2 for every dwelling for residents with a total floor area greater than 150 square metres, plus 1 for every 10 dwellings for visitors, and in all other cases 1 space for every 4 dwellings for residents plus 1 for every 10 dwellings for visitors.
Residential component of a multi-storey building	Within the City of Adelaide 1 for every dwelling for residents with a total floor area less than 150 square metres, 2 for every dwelling for residents with a total floor area greater than 150 square metres, plus 1 for every 10 dwellings for visitors, and in all other cases 1 space for every 4 dwellings for residents plus 1 space for every 10 dwellings for visitors.
Shop	1 space for every 300m2 of gross leasable floor area plus 1 space for every 600m2 of gross leasable floor area for customers.
Tourist accommodation	1 space for every 20 employees plus 2 for the first 40 rooms and 1 for every additional 40 rooms for visitors.
Schedule to Table 3	**Designated Area** / **Relevant part of the State**

	The bicycle parking rate applies to a designated area located in a relevant part of the State described below.
All zones	City of Adelaide
Business Neighbourhood Zone Strategic Innovation Zone Suburban Activity Centre Zone Suburban Business Zone Suburban Main Street Zone Urban Activity Centre Zone Urban Corridor (Boulevard) Zone Urban Corridor (Business) Zone Urban Corridor (Living) Zone Urban Corridor (Main Street) Zone Urban Neighbourhood Zone	Metropolitan Adelaide

Waste Treatment and Management Facilities

Assessment Provisions (AP)

Desired Outcome (DO)

Desired Outcome	
DO 1	Mitigation of the potential environmental and amenity impacts of waste treatment and management facilities.

Performance Outcomes (PO) and Deemed-to-Satisfy (DTS) Criteria / Designated Performance Feature (DPF)

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
Siting	
PO 1.1 Waste treatment and management facilities incorporate separation distances and attenuation measures within the site between waste operations areas (including all closed, operating and future cells) and sensitive receivers and sensitive environmental features to mitigate off-site impacts from noise, air and dust emissions.	DTS/DPF 1.1 None are applicable.
Soil and Water Protection	
PO 2.1 Soil, groundwater and surface water are protected from contamination from waste treatment and management facilities through measures such as: (a) containing potential groundwater and surface water contaminants within waste operations areas	DTS/DPF 2.1 None are applicable.

(b) diverting clean stormwater away from waste operations areas and potentially contaminated areas (c) providing a leachate barrier between waste operations areas and underlying soil and groundwater.	
PO 2.2 Wastewater lagoons are set back from watercourses to minimise environmental harm and adverse effects on water resources.	DTS/DPF 2.2 Wastewater lagoons are set back 50m or more from watercourse banks.
PO 2.3 Wastewater lagoons are designed and sited to: (a) avoid intersecting underground waters; (b) avoid inundation by flood waters; (c) ensure lagoon contents do not overflow; (d) include a liner designed to prevent leakage.	DTS/DPF 2.3 None are applicable.
PO 2.4 Waste operations areas of landfills and organic waste processing facilities are set back from watercourses to minimise adverse impacts on water resources.	DTS/DPF 2.4 Waste operations areas are set back 100m or more from watercourse banks.
Amenity	
PO 3.1 Waste treatment and management facilities are screened, located and designed to minimise adverse visual impacts on amenity.	DTS/DPF 3.1 None are applicable.
PO 3.2 Access routes to waste treatment and management facilities via residential streets is avoided.	DTS/DPF 3.2 None are applicable.
PO 3.3 Litter control measures minimise the incidence of windblown litter.	DTS/DPF 3.3 None are applicable.
PO 3.4 Waste treatment and management facilities are designed to minimise adverse impacts on both the site and surrounding areas from weed and vermin infestation.	DTS/DPF 3.4 None are applicable.
Access	
PO 4.1 Traffic circulation movements within any waste treatment or management site are designed to enable vehicles to enter and exit the site in a forward direction.	DTS/DPF 4.1 None are applicable.
PO 4.2 Suitable access for emergency vehicles is provided to and within waste treatment or management sites.	DTS/DPF 4.2 None are applicable.
Fencing and Security	
PO 5.1 Security fencing provided around waste treatment and management facilities prevents unauthorised access to operations and potential hazard to the public.	DTS/DPF 5.1 Chain wire mesh or pre-coated painted metal fencing 2m or more in height is erected along the perimeter of the waste treatment or waste management facility site.
Landfill	
PO 6.1 Landfill gas emissions are managed in an environmentally acceptable manner.	DTS/DPF 6.1 None are applicable.

PO 6.2 Landfill facilities are separated from areas of environmental significance and land used for public recreation and enjoyment.	DTS/DPF 6.2 Landfill facilities are set back 250m or more from a public open space reserve, forest reserve, national park or Conservation Zone.
PO 6.3 Landfill facilities are located on land that is not subject to land slip.	DTS/DPF 6.3 None are applicable.
PO 6.4 Landfill facilities are separated from areas subject to flooding.	DTS/DPF 6.4 Landfill facilities are set back 500m or more from land inundated in a 1% AEP flood event.
Organic Waste Processing Facilities	
PO 7.1 Organic waste processing facilities are separated from the coast to avoid potential environment harm.	DTS/DPF 7.1 Organic waste processing facilities are set back 500m or more from the coastal high water mark.
PO 7.2 Organic waste processing facilities are located on land where the engineered liner and underlying seasonal water table cannot intersect.	DTS/DPF 7.2 None are applicable.
PO 7.3 Organic waste processing facilities are sited away from areas of environmental significance and land used for public recreation and enjoyment.	DTS/DPF 7.3 Organic waste processing facilities are set back 250m or more from a public open space reserve, forest reserve, national park or a Conservation Zone.
PO 7.4 Organic waste processing facilities are located on land that is not subject to land slip.	DTS/DPF 7.4 None are applicable.
PO 7.5 Organic waste processing facilities separated from areas subject to flooding.	DTS/DPF 7.5 Organic waste processing facilities are set back 500m or more from land inundated in a 1% AEP flood event.
Major Wastewater Treatment Facilities	
PO 8.1 Major wastewater treatment and disposal systems, including lagoons, are designed to minimise potential adverse odour impacts on sensitive receivers, minimise public and environmental health risks and protect water quality.	DTS/DPF 8.1 None are applicable.
PO 8.2 Artificial wetland systems for the storage of treated wastewater are designed and sited to minimise potential public health risks arising from the breeding of mosquitoes.	DTS/DPF 8.2 None are applicable.

Workers' accommodation and Settlements

Assessment Provisions (AP)

Desired Outcome (DO)

Desired Outcome	
DO 1	Appropriately designed and located accommodation for seasonal and short-term workers in rural areas that minimises environmental and social impacts.

Performance Outcome	Deemed-to-Satisfy Criteria / Designated Performance Feature
PO 1.1 Workers' accommodation and settlements are obscured from scenic routes, tourist destinations and areas of conservation significance or otherwise designed to complement the surrounding landscape.	DTS/DPF 1.1 None are applicable.
PO 1.2 Workers' accommodation and settlements are sited and designed to minimise nuisance impacts on the amenity of adjacent users of land.	DTS/DPF 1.2 None are applicable.
PO 1.3 Workers' accommodation and settlements are built with materials and colours that blend with the landscape.	DTS/DPF 1.3 None are applicable.
PO 1.4 Workers' accommodation and settlements are supplied with service infrastructure such as power, water and effluent disposal sufficient to satisfy the living requirements of workers.	DTS/DPF 1.4 None are applicable.

No criteria applies to this land use. Please check the definition of the land use for further detail.

Australia Plains Solar Farm

Development Application Report *(Revision 1)*

Source: https://greengoldenergy.com.au/wp-content/uploads/2017/12/Aerial-1024x576.jpg

Submitted to:

Green Gold Energy
216 Glen Osmond Rd,
Fullarton
South Australia 5063

Prepared by:

Planning Aspects Pty Ltd
P O Box 968
Kensington Gardens
South Australia 5068

+61 418 856 580

22 January 2024

Table of Contents

FIGURES AND TABLES

APPENDICES

ABBREVIATIONS

APSP	Australia Plains Solar Project Pty Ltd
MW	Megawatt
MWh	Megawatt-hour
BESS	Battery Energy Storage System
Ha	Hectares
IHC	Independent Heritage Consultants
Km	Kilometres
DEM	Department for Energy and Mines
PDI Act	*Planning, Development and Infrastructure Act 2016*
EPC	Engineering, Procurement and Construction
PV	Photovoltaic
kW	Kilowatts
kV	Kilovolt
CCTV	Closed-circuit Television
FCAS	Frequency Control Ancillary Services
OTR	Office of the Technical Regulator
FFR	Fast Frequency Response
SCAP	State Commission Assessment Panel
DEW	Department for Environment and Water
DIT	Department for Infrastructure and Transport
NVC	Native Vegetation Council
CFS	Country Fire Service
SIS	State Infrastructure Strategy
NVA	*Native Vegetation Act 1991*
NPW	*National Parks and Wildlife Act 1972*
EPA	Environment Protection Authority
CEMP	Construction Environmental Management Plan
IHC	Independent Heritage Consultants

AHA	*Aboriginal Heritage Act 1988*
HPA	*Heritage Places Act (SA) 1994*
NHVR	National Heavy Vehicle Regulator
LGA	*Local Government Act 1999*
EPBC	*Environment Protection and Biodiversity Conservation Act 1999*
MNES	Matters of National Environmental Significance
UNGI	Underwriting New Generation Investments
M	Metre(s)
SEB	Significant Environmental Benefit
DPC-AAR	Department of Premier and Cabinet-Aboriginal Affairs
PDIA	*Planning, Development and Infrastructure Act (SA) 2016*
EBS	EBS Ecology
TEC	Threatened Ecological Species

1.0 INTRODUCTION

Australia Plains Solar Farm Project comprises a proposal to install approximately 435,450 solar photovoltaic (PV) panels with a total export capacity of approximately 200 MW and associated infrastructure on two (2) land parcels, (the subject site) totalling approximately 429 hectares (ha) at Australia Plains. The subject site is located approximately 16.2 kilometres (km) north-east of the township of Eudunda in the Regional Council of Goyder (see Figure 1).

The proposed development is known as the Australia Plains Solar Farm (the Project) (see Figure 2).

Figure 1: Location of Australia Plains Solar Farm

This Development Application Report (prepared for Green Gold Energy (APSP) by Planning Aspects Pty Ltd) details the various components of the proposed solar farm, provides an assessment of the development against the relevant planning provisions and discusses how the potential environmental, social and economic impacts arising from the project will be managed.

Separately Green Gold Energy (APSP) has lodged an application with the Department for Energy and Mines (DEM) for the BESS associated with the Project to be considered for an exemption pathway under Schedule 13 of the *Planning, Development and Infrastructure (General) Regulations 2017* which provides for the following form of development to be exempt from the need to secure Development Approval:

- the construction, reconstruction or alteration of a battery storage facility for the purposes of supporting the security or reliability of the State's power system.

- any infrastructure, structures, equipment or works associated with or ancillary to development in accordance with the above, including electricity powerlines, poles and fences, fuel supply infrastructure and roads or other means of access to such development.
- on a site identified by the Minister for Planning by notice published in the Gazette.

Green Gold Energy understands that a private sector operator can receive the benefit of such an exemption where the project is sponsored by the Minister for Energy and Mining in accordance with section 131 of the *Planning, Development and Infrastructure Act (PDIA) 2016*.

The exemption applies to a battery storage facility of one (1) or more batteries of a total capacity of more than 25 MW that are capable of being charged, storing energy, and discharging it into the State's power system. The Project is for a BESS with a capacity of 200 MW.

The main component of the project, the subject of this Development Application, is the solar farm project and does not include the BESS.

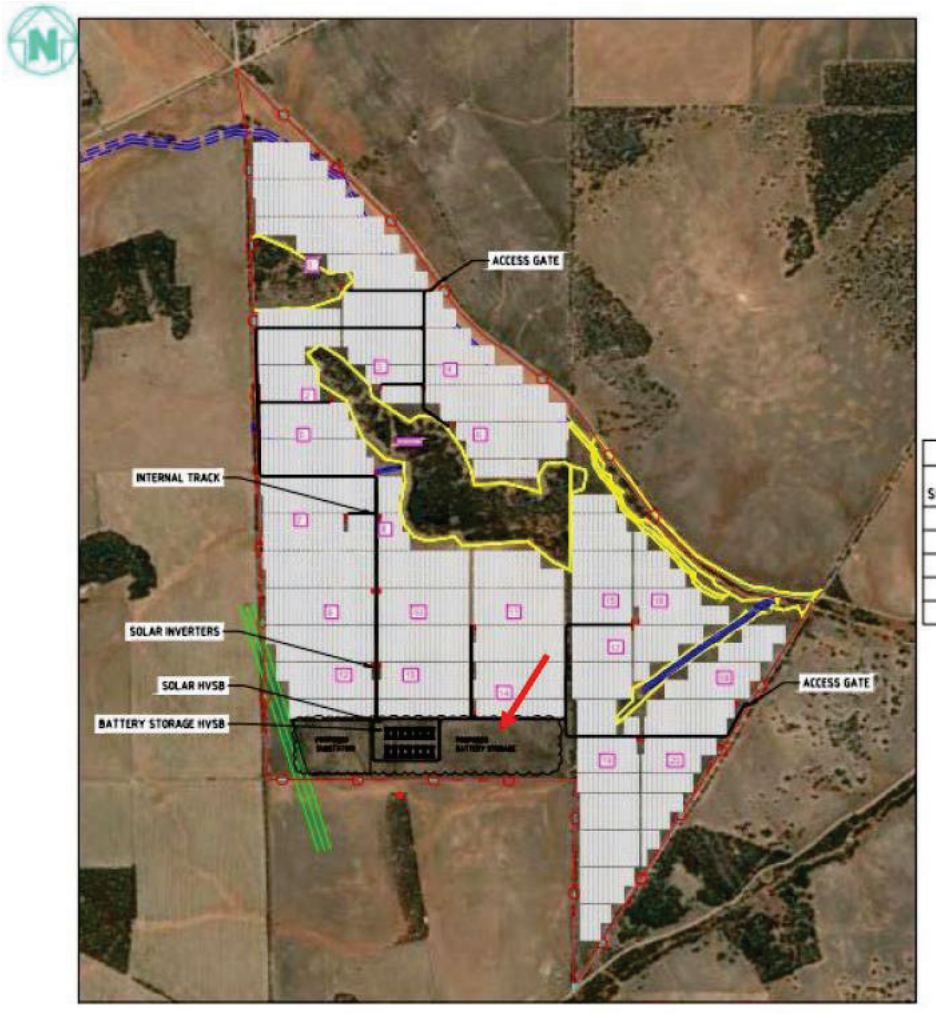


Figure 2: Siting of Solar Panels

1.1 Applicant Details

APSP is the special purpose vehicle registered on 15 April 2019 by its parent company – Golden Invest – to oversee the proposed solar farm development. Golden Invest has been operating as a solar farm developer and Engineering, Procurement and Construction (EPC) contractor through its joint venture company, Green Gold Energy in both South Australia and Victoria for the past ten (10) years.

Green Gold Energy is a company specialising in the development, construction, operation and general contracting of solar farms across South Australia, Victoria and New South Wales. Incorporating the latest photo voltaic (PV) technology into its operations, Green Gold Energy has been actively providing renewable energy and storage solutions to a range of clients with over 10 large-scale solar farms built in South Australia since 2017. These range in capacity from 200 kilowatts (kW) to 4.95 MW with a further three (3) projects under construction and nine (9) projects in the development pipeline.

The proposed Australia Plains Solar Farm is one of the first utility-scale solar projects that Golden Invest will manage and develop in South Australia.

As part of its ongoing commitment to quality and customer satisfaction, Green Gold Energy has achieved ISO 9001:2008, ISO 14001:2004 and AS/NZS 4801:2001 Certification ensuring that projects are completed in a safe and environmentally responsible manner.

Table 1: Applicant Details

Details	Description
Applicant Name	Green Gold Energy Pty Ltd
Applicant Address	216 Glen Osmond Road, Fullarton SA 5063
Applicant Contact Person	Elton Zhang
Applicant Mobile Number	0447 026 237
Company ABN	61 618 000 874
Company Address	216 Glen Osmond Road, Fullarton SA 5063
Company Establishment	2017

1.2 Project Overview

APSP proposes to develop a 200 MW Solar Farm with supporting infrastructure on two (2) allotments, namely Lot 315 Bower Road and 91 Mickan Road, Australia Plains. The entire project comprises the following components:

- Installation of approximately 435,450 solar photovoltaic (PV) panels with a total export capacity of approximately 200 MW.
- Installation of underground cabling connecting:
    - the PV panels to inverters;
    - inverters to the BESS; and
    - inverters to the on-site substation.
- Development of an on-site substation, located near the western boundary of the Bower Road allotment, in close proximity to the existing 275 kilovolt (kV) transmission line which traverses the site in a north-west to south-east direction at that location.
- Installation of an overhead transmission line connecting the on-site substation to the transmission network.
- Development of buildings and structures to support the operation of the solar farm, including:
    - site offices (containerised buildings); and
    - storage containers housing equipment, general items and staff amenities.
- Installation of water tanks for fire-fighting purposes.

- Development of two (2) site access points:
    - on the northern tip of the Bower Road allotment close to the intersection of Schulz and Bower Roads; and
    - off Bower Road along the northern boundary of the Mickan Road allotment.
- Development of internal access roads / tracks within the subject site.
- Installation of closed-circuit Television (CCTV) devices.
- Development of cyclone mesh security fencing around the perimeter of the site.

The Project will improve the penetration of renewable energy in transmission network and maintain the network strength and stability. The connection of APSP will bring a range of benefits and support functions to the grid including Frequency Control Ancillary Services (FCAS), reduction of grid congestion, voltage stabilization, frequency regulation, energy arbitrage and enhancing system inertia. In addition to the above common benefits, the project will use grid-forming technology which will enable isolated restart after a blackout event. This means that the Project will have a greater responsibility for recovering the power network from blackout.

1.2.1 Grid Connection

The proposed solar farm has obtained approval from the Office of the Technical Regulator (OTR) with a copy of the OTR Certificate obtained on 4th October 2023 and is included in **Appendix A**.

APSP is committed to installing technology on the subject site which meets the Fast Frequency Response (FFR) and / or inertia requirements of the OTR. This will be achieved through the installation of a BESS.

The project will connect via cut-in at the Robertstown 275kV cable, which will be facilitated by a substation to be constructed on site. With the interconnector cable coming into play, there will be more capacity than what currently exists at the Robertstown substation.

1.3 Approval Pathway

Given the significance of the proposed solar farm in augmenting critical renewable energy infrastructure within the State, APSP has secured the support of the South Australian Department for Energy and Mining (DEM) to sponsor the proposed development, enabling its assessment under the provisions of Section 131 of the *Planning, Development and Infrastructure Act 2016* by the State Commission Assessment Panel (SCAP).

A copy of the letter confirming Crown Sponsorship through DEM is attached in **Appendix B**.

This Development Application report will be lodged with SCAP and subsequently referred to other government agencies and the Regional Council of Goyder for review and comment in accordance with Schedule 9 of the *Planning, Development and Infrastructure (General) Regulations 2017*. The prescribed referral bodies are the Department for Environment and Water (DEW), Department for Infrastructure and Transport (DIT), Native Vegetation Council (NVC) and the Regional Council of Goyder.

Preparation of this Development Application has been undertaken in consultation with the above-mentioned agencies and other bodies, including:

- DEM (sponsoring agency) and the OTR regarding the Crown Development process and the compliance of the proposed solar farm in providing the required levels of security and stability of the State's power system.
- DIT regarding the traffic / access implications of the proposed solar farm.
- DEW and the NVC regarding the watercourses located on the subject site and the clearance of native vegetation required to accommodate the proposed solar farm.
- Regional Council of Goyder regarding access to the proposed development from Council-owned roads and also to keep Council informed of progress of the solar farm development so that it can meaningfully respond to the SCAP referral process.
- SCAP by way of a 'pre-lodgement' meeting to discuss the key issues to be addressed in this Development Application.
- ElectraNet in relation to the integration of the proposed solar farm into the electricity transmission network.
- Country Fire Service (CFS) regarding the location of the proposed development within a 'Hazard (Bushfire Regional) Overlay' area and how it has been designed to mitigate this risk.

The proposed development site is located entirely within the Regional Council of Goyder and will be assessed against the relevant zone, overlay and general provisions of the *Planning and Design Code (the Code)*.

1.4 Project Timing

Development of the proposed Australia Plains Solar Farm and associated infrastructure is an important component of Green Gold Energy's emerging renewable energy asset portfolio. Development approval to be obtained by mid-2024, connection approval expected by the end of 2024 construction to commence 2025 and project site operational in 2027.

2.0 STATEMENT OF ECONOMIC EFFECTS OF DEVELOPMENT

The following sections discuss the strategic context for the proposed solar farm development drawing on State and Commonwealth Government priorities and relevant State and Federal legislation.

The South Australian Government has announced a commitment to deliver more jobs, lower costs and better services. The proposed solar farm will support these objectives by providing employment opportunities through regional investment, improving grid reliability and lowering electricity costs by increasing the supply of renewable energy to the market, as discussed below.

The proposed development is expected to bring in $510M worth of investment value. It is expected to offer job opportunities during the construction phase in the local area and uplifting local economy for the duration of the construction phase. The Project also turns open land into a steady investment for the landowner for the next 40 years.

The entire APSP project is able to power over 70,000 households in Australia. With a 400MWh battery the project will discharge its electricity back into the grid during peak hours, thus allowing the price of electricity to be more stable and have less fluctuations during peak demand times.

Over 150 job opportunities will be available in the region during construction over an 18-month period. Post construction there will be a maintenance crew that will be employed to do maintenance work throughout the year.

Green Gold Energy has been developing and building solar projects in Australia with currently over 1GWh worth of projects in the pipeline.

2.1 Strategic Planning Context

2.1.1 Mid North Region Plan

The Mid North Region Plan (2011) is a volume of the South Australian Planning Strategy and provides strategic guidance for land use and development, provision of services and infrastructure, and management of population and climate change.

Key issues identified as critical to the region's future development include the following:

- Environment and culture
    - Planning for the impacts of climate change on the region's environment, particularly on infrastructure and the regional economy.
    - Ensuring development protects and preserves the region's environmental assets, including native vegetation and water resources.
    - Ensuring development is appropriately located and does not adversely affect scenic landscapes.
- Economic development
    - Attracting and retaining a highly skilled and flexible workforce to ensure a stronger economic base.
    - Encouraging the development of wind farms in appropriate locations and the training of people in the region to undertake their operation and maintenance.
    - Attracting industry to the region, particularly where there is infrastructure capacity for growth (e.g., electricity).

  - Continuing to foster the development and diversification of primary industries and supporting the sustainable adaptation of primary industries to climate change.

- Population and settlements
  - Providing greater employment opportunities and challenges to retain young people.
- Infrastructure and service provision
  - Expanding local electricity generation through renewable energy sources to provide greater capacity for economic activity.
  - Planning for the expansion of transmission infrastructure required to meet increased electricity generation.
  - Maximising economic benefits by making the best use of existing and planned infrastructure.

The project builds on the Mid North region's strategic renewable energy infrastructure which will support and strengthen regional economic growth and provide greater employment opportunities while increasing the capacity of the region to adapt to climate change.

It should be noted that the Mid North Region Plan is currently under review as part of the transition to the new planning system in South Australia. However, the Plan's strategic directions, as applicable to the proposed solar farm development and the land on which this infrastructure will be developed, are unlikely to change.

2.1.2 State Infrastructure Strategy

Infrastructure SA released the 20-year State Infrastructure Strategy (SIS) in May 2020 which sets the strategic direction and initial priorities for infrastructure development across the State. The SIS puts forward a range of infrastructure projects / investments that support the State Government's economic growth target of 3% per annum with the fundamental aim being to prioritise infrastructure that contributes to economic and jobs growth. The following table identifies the priorities in the SIS of particular relevance to the proposed solar farm:

Table 2: Relevant State Infrastructure Strategy Priorities

Priority	Detail
Priority 1	*Develop frameworks that appropriately value the economic contribution of regional projects when prioritising infrastructure.*
Priority 30	*Support sufficient firm capacity or dispatchable power to enable an efficient and reliable energy market in South Australia.*
Priority 31	*Support additional demand response measures.*
Priority 32	*Support measures to mitigate a net negative demand from the grid in an efficient way.*

The SIS acknowledges that South Australia has been leading the nation in the transition to renewable energy given the significant investment that has occurred in large-scale wind and solar farms. However, further investment in utility-scale storage and interconnection will be required to

ensure the ongoing stability and reliability of the energy market in South Australia, which is reflected in priorities 30-32 of the SIS noted in the table above. This Project responds directly to those requirements.

The Project has been designed to respond to these requirements with technology to be installed on the subject site which meets the FFR and / or inertia requirements of the OTR.

2.2 Legislative Context

This exemption application has taken into consideration the following legislative requirements.

Table 3: Relevant Legislation

Legislation	Project response to requirements
South Australian Legislation	
Planning, Development and Infrastructure Regulations, 2017	Schedule 8 15 (1) prescribes that if the proposed development is for the provision of electricity generating plant with a generating capacity of more than 5 MW that is to be connected to the State's power system, a certificate from the Office of the Technical Regulator (OTR) is required certifying that the proposed development complies with the requirements of the Technical Regulator in relation to the security and stability of the State's power system. A copy of the OTR Certificate is attached in **Appendix A**.
Native Vegetation Act, 1991	Any clearance of native vegetation requires consent from the Native Vegetation Council (NVC). The proposed Solar array location contains native vegetation protected under the *Native Vegetation Act 1991*. A native vegetation clearance application and calculation of a Significant Environmental Benefit has been prepared by EBS Ecology (see **Appendix H**). Most of the impact footprint of the Project has been micro-sited to clear vegetation in poorer condition that are heavily impacted by historical land clearing, grazing, and weed infestation. Only smaller patches of vegetation in good to excellent condition, including Mallee and woodland areas. are impacted. Construction contractors will develop and implement a Construction Environmental Management Plan (CEMP). This plan will include management strategies for minimising the impacts caused by vegetation clearance. Rehabilitation and restoration of vegetation will be permitted in the solar array following the initial construction impact, including regeneration of low grasses and shrubs under the installed solar panels and in alternate 'gap' corridors initially used for access. Rehabilitation of native vegetation is preferable for solar farm projects to reduce dust accumulation on panels and associated maintenance.

Legislation	Project response to requirements
National Parks and Wildlife (NPW) Act, 1972	It is an offence to remove a native plant or protected animal without approval. An ecological assessment of the subject site identified areas that should be avoided when siting project infrastructure to ensure ongoing protection of rare species. The proponent has designed the solar array associated overhead powerlines layout and siting to ensure these areas are avoided and remain intact.
Environment Protection Act, 1993	As the nature of activities associated with the project do not form an activity of major environmental significance, the EPA does not anticipate being a referral body for the project. The proponent will engage with the EPA on any requirements for its contractors to hold relevant licences and approvals for earthworks and drainage associated with construction of the Solar array and associated overhead powerlines.
Landscape South Australia Act, 2019	The proponent has considered and will comply with all requirements in relation to the management and protection of land, plants, animals and watercourses. This includes appropriate management of pest plant and animal species during construction and rehabilitation of the subject site as part of the CEMP.
Aboriginal Heritage Act, 1988	The proponent engaged Independent Heritage Consultants (IHC) to undertake a desktop cultural heritage assessment of the proposed solar array and associated overhead powerlines. The assessment found that there are no registered or culturally significant sites in the project area and concluded that there is a low risk for works associated with the proposed development to impact Aboriginal archaeological sites. As there are no known Aboriginal heritage sites within the project area, there is no need to seek Ministerial authorisation to impact heritage under section 23 of the *Aboriginal Heritage Act 1*988 (AHA). However, all Aboriginal heritage sites are protected under the AHA, whether reported/registered or undocumented. Therefore, if a previously unknown Aboriginal heritage site is discovered during works and cannot be avoided, Ministerial authorisation under section 23 of the AHA will be required. Although not mandated by the AHA, a number of management options have been recommended to mitigate the assessed heritage risk. These include implementation of a site discovery procedure, site inductions, consultation with the relevant Aboriginal groups and archaeologists on call to identify potential discoveries. The client has been advised that although the anthropological risk is low, the relevant Aboriginal groups may still have interests in the area and appreciate consultation on broader issues which fall under community engagement. Further consultation is at the discretion of the client.

Legislation	Project response to requirements
Native Title (South Australia) Act, 1994	The proponent will comply with all requirements related to Aboriginal cultural heritage and Native Title under both State and Commonwealth legislation. The study area sits at the intersection of two native title claim areas. The First Peoples of the River Murray and Mallee # Claim area to the east and the Ngadjuri People #2 to the west. The Federal Court has accepted both claims, but only made a determination in regard to the Ngadjuri claim (2023) and determined that native title has been extinguished in these areas. There are no Indigenous Land Use Agreements in place.
Heritage Places Act, 1993	The proponent engaged IHC to undertake a desktop assessment for non-Aboriginal heritage which found there to be a low likelihood for works to impact European and contact period archaeological features. The heritage assessment determined that there are no listed historic heritage places within the project area and that based on historic context and previous land use, there is a low risk of works encountering the remains of built heritage and archaeological features of heritage significance. All historic heritage and archaeological features, whether listed or not, are protected and must be managed in line with the requirements of the *Heritage Places Act (SA) 1994* (HPA) and the *Planning, Development and Infrastructure Act (SA) 2016*, (PDIA)s. If during construction any unexpected, potentially significant, historic heritage items of significance are found, finds should be immediately reported to Heritage SA. Although not mandated by the HPA, a number of management options have been recommended to mitigate the assessed heritage risk. These include implementation of a site discovery procedure, site inductions and archaeologists on call to identify potential discoveries. Management options to ensure that the proposed works comply with the requirements of the Act will form part of the CEMP.
Road Traffic Act, 1961	The transport of construction materials associated with the proposed development has the potential to impact on the local road network. The proponent engaged CIRQA to prepare a Traffic Impact Assessment. A review of options for access routes to accommodate vehicle movements associated with the site has been undertaken. Based on opportunities and constraints identified during detailed site inspections, it has been recommended that vehicles accessing the site do so vie either: • between Worlds End Highway and Emmaus Road; and / or • Worlds End Highway, Schulz Road and Bower Road (or alternatively the unnamed/unmade road immediately west of the site subject to appropriate upgrade).

Legislation	Project response to requirements
	In addition, internal access provisions between the two sites is desirable (i.e. 91 Mickan Road be accessed via Lot 315 Bower Road). A review of the likely traffic generation associated with the proposal has been undertaken. The peak generation of traffic will be associated with the construction of the facility which will include both commercial vehicle movements and light / domestic vehicle (car) movements. Typical volumes generated by the construction of the site will be relatively low (less than 15 movements per day) and well within the capacity of the adjacent road network. It has been recommended that the approach of Emmaus Road and / or Schulz Road (depending on route adopted) to Worlds End Highway be spray sealed for 20m to minimise gravel spread on to the Highway. No other road network upgrades are considered required to accommodate the forecast movements on the recommended route. Application to the National Heavy Vehicle Regulator (NHVR) will be required for the use of restricted access vehicles (such as B-Doubles) and over-dimensional / over-mass vehicles. However, it is considered that such vehicles can be appropriately accommodated on both of the recommended routes. A Traffic Management Plan will be prepared by the construction contractor to confirm the route that will be used by heavy vehicles accessing the site and to manage impacts during construction.
Local Government Act, 1999	Pursuant to the provisions of Section 221 (Alteration of road) of this Act, an authorisation is not required for an alteration to a road if '*…the person who proposes to make the alteration has some other statutory authorisation to make the alteration*' (e.g. development approval secured under the Planning, Infrastructure and Development Act). A Traffic Impact Assessment has been prepared to support the project and is attached as **Appendix E**.
Electricity Act, 1996	The proponent has undertaken due diligence and secured all required licences and approvals related to providing a safe, reliable and renewable supply of energy to the grid at Australia Plains (via the on-site substation). The proposed development has been designed to meet the legal requirements for vegetation clearance around high voltage transmission lines.
Climate Change and Greenhouse Emissions Act, 2007	The proposed Solar farm will facilitate the development and commercialisation of renewable energy and technologies across the Mid North region in accordance with the objects of this Act.
Commonwealth Legislation	

Legislation	Project response to requirements
Environment Protection and Biodiversity Conservation (EPBC) Act, 1999	The proponent engaged EBS to undertake ecological surveys and assessments to determine the likelihood of the project impacting on Matters of National Environmental Significance (MNES). Based on the ecological assessment undertaken by EBS, the Solar farm is not expected to have an impact on any MNES. Large areas of suitable habitat for EPBC Act listed threatened species habitat has been avoided by the project design. This includes areas of Mallee and woodland. Most of the impact footprint of the Project has been micro-sited to clear vegetation in poorer condition that are heavily impacted by historical land clearing, grazing, and weed infestation. Only smaller patches of vegetation in good to excellent condition, including Mallee and woodland areas are impacted. Construction contractors will develop and implement a CEMP. This plan will include management strategies for minimising the impacts caused by vegetation clearance. Rehabilitation and restoration of vegetation will be permitted in the solar array following the initial construction impact, including regeneration of low grasses and shrubs under the installed solar panels and in alternate 'gap' corridors initially used for access. Rehabilitation of native vegetation is preferable for solar farm projects to reduce dust accumulation on panels and associated maintenance.
Aboriginal and Torres Strait Islander Heritage Protection Act, 1984	The proponent engaged IHC to undertake a desktop cultural heritage assessment of the proposed Solar farm. The assessment found that there are no registered or culturally significant sites in the project area and concluded that there is a low risk for works associated with the proposed development to impact Aboriginal archaeological sites. Management options to ensure that the proposed works comply with the requirements of the Act will form part of the CEMP.

2.3 Commonwealth Government Context

The Commonwealth Government has initiated several policy responses that are of relevance to the proposed Solar Farm.

2.3.1 Climate Change Response

Australia has a suite of policies to reduce domestic emissions and support the Paris Agreement commitment to a low-carbon, climate resilient future. The proposed development will contribute towards a number of the objectives of the Commonwealth Government's climate change plan including:

- Emissions reduction targets;

- Increasing renewable energy capacity;
- Encouraging uptake of renewable energy; and
- Improved energy productivity.

2.3.2 Energy Strategy

The Department of the Environment and Energy has developed a plan, "*Powering forward: a better energy future for Australia*" which sets out the Government's priorities in providing an affordable and reliable energy system that will help meet international commitments (Australian Government, 2017). Three main issues are identified in the current energy market; affordability, reliability and emissions. In response to these issues, the Government is establishing the Underwriting New Generation Investments (UNGI) to create an ongoing mechanism supporting targeted investment to deliver on its commitments.

The proposal provides solutions to the issues identified by increasing the supply of competitively priced energy on the national market, providing energy grid security (subject to network studies with ElectraNet) and facilitating deployment of variable renewable energy to reduce emissions.

3.0 EXISTING ENVIRONMENT

The Mid North region covers approximately 23,000 square kilometres (km^2) stretching from the Clare and Gilbert Valleys in the south, west to Port Pirie on the Spencer Gulf, north to the Southern Flinders Ranges and north-east to the pastoral lands beyond Goyder's Line.[1] The subject site is situated very close to Goyder's Line on land considered to be better suited to grazing activities as opposed to cropping.

The region is home to approximately 6.6% of the State's population, with the majority of people living in major towns located towards the western extent of the region away from the site of the proposed Solar Farm.

The regional economy is based on primary production and processing, light industry and tourism, reflecting the region's variable climate and landscapes. There is one major population and service centre, namely Port Pirie, which is located on the Spencer Gulf towards the western edge of the region. The township of Eudunda, located approximately 16.2 km south-west of the subject site, is a small commercial and servicing centre supporting productive grains and agribusiness industries.

3.1 Subject Site and Locality

3.1.1 Subject Site

Bounded by an unnamed road and part of Junction Road to the west, an unnamed road to the south, Mickan Road to the east, Bower Road to the north and north-east, the subject site is located on 249 hectares of privately-owned rural land formally described as follows:

- Section 315, Hundred of English in the area named Australia Plains in Certificate of Title 5972/348 (Lot 315 Bower Road); and
- Section 57, Hundred of Bower in the area named Australia Plains in Certificate of Title 5907/538 (91 Mickan Road).

A copy of the Certificates of Title is attached in **Appendix C**. The Certificates of Title notes an easement traversing the south-east corner of the site accommodating ElectraNet's 275 kV overhead transmission line, to which the proposed BESS associated with the development of the Solar Farm will be connected via the on-site substation.

3.1.2 Site Features

Both land parcels are irregularly shaped and relatively flat with grades running south-west to north-east of 2-5%. The subject site has been used primarily for agricultural purposes - predominantly low-density grazing and some cropping - in the past and is currently devoid of buildings and land-based infrastructure. While the site has been largely cleared of native vegetation to facilitate its use for agriculture, it contains several areas of remnant vegetation totalling approximately 55 hectares identified during the ecological survey as providing valuable habitat for important fauna species. These areas have been avoided as part of the proposed solar farm layout and will be protected during construction of the development.

The site also contains several water flow paths, all of which are to be protected by establishing a 10 metre (m) buffer between these paths and the solar panels.

[1] Goyder's Line was established by the South Australian Surveyor-General in 1865 to delineate land suitable for cropping south of the line from land more suited to extensive grazing north of the line.

3.1.3 Locality

The surrounding locality is comprised of privately-owned rural landholdings with grazing and some cropping activities evident. The nearest residence is located approximately 160m from the northern tip of the Bower Road allotment across Schulz Road.

The locality generally consists of land that is sparsely vegetated, but which also contains scattered clusters of native vegetation (primarily mallee). There are numerous water courses in the locality, with a major drainage basin located north-west of the subject site and extending in a south-easterly direction along its northern boundary.

4.0 PROJECT DESCRIPTION

The Australia Plains Solar Farm comprises the following infrastructure components:

- Installation of approximately 435,450 solar photovoltaic (PV) panels with a total export capacity of approximately 200 MW. Panels will be attached to trackers in a 2P (or vertical two-panel) arrangement with approximately 4032 rows of trackers, each containing around 108 PV panels, distributed across the site (refer section 4.1.1 below).
- Installation of underground cabling connecting:
    - the PV panels to inverters; and
    - inverters to the on-site substation.
- Development of an on-site substation located in the south-west corner of the site in close proximity to the existing 275 kilovolt (kV) transmission line which traverses the site at that location.
- Installation of an overhead transmission line connecting the on-site substation to the transmission network.
- Development of buildings and structures to support the operation of the solar farm, including:
    - site offices (containers); and storage containers housing equipment, general items and staff amenities.
- Installation of water tanks for fire-fighting purposes (with the precise number and location to be determined in liaison with the CFS).
- Development of two (2) site access points on the northern boundary of the site as follows:
    - at the intersection of Bower and Junction Roads; and
    - off Bower Road approximately 340 metres north-west of the intersection of Bower and Junction Roads.
- Development of internal access roads/tracks within the subject site.
- Installation of closed-circuit TV (CCTV) devices.
- Development of cyclone mesh security fencing around the perimeter of the site.

Figure 3 (below) shows the location of key project components and site access points. A detailed description is provided in section 4.1 below with a set of plans attached in **Appendix D**.

It should be noted that the detailed design phase of the project has yet to be completed. The information presented in the following sections is based on the preliminary design with some minor changes expected to the precise design and configuration of the proposed solar farm, with any change to be in line with approval requirements.

4.1 Project Components

The main components of the project are described in detail below.

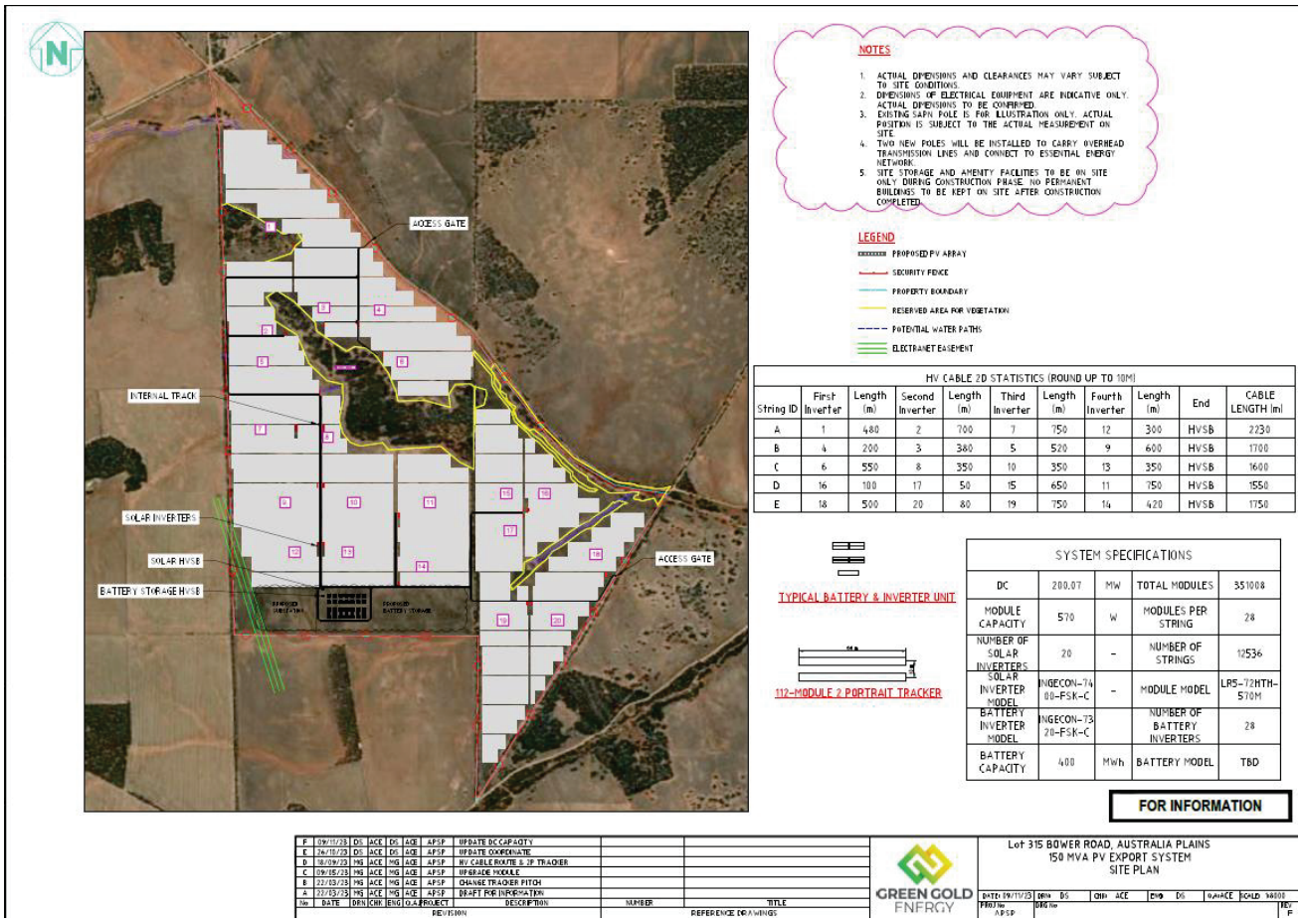


Figure 3: Site Layout

4.1.1 Overhead Transmission Line and Grid Connection

A new 275kV overhead transmission line will be installed to connect the on-site substation to ElectraNet's transmission network. This line will be approximately 100 metres in length and will 'cut into' the existing transmission line located above the area in which the substation is proposed.

APSP will continue to liaise with ElectraNet to determine the precise requirements for grid connection, including the type of pole structures needed to support the new 275kV line, which will be confirmed during the detailed design phase.

4.1.2 Substation

The proposed on-site substation is to be developed in the south-west corner of the Bower Road allotment to take advantage of its close proximity to the existing 275kV transmission line which traverses the site at that location. The new substation will accommodate additional electricity infrastructure required to support the proposed solar farm and its connection to the transmission network. Security fencing, technical control and CCTV devices typical of substation developments will be installed to allow the site to be remotely monitored while ensuring public safety and protection of the infrastructure.

Plans of the proposed substation have yet to be developed as the precise configuration of the facility is dependent on the final network requirements. A detailed substation plan will be provided on completion of the detailed design phase of the development.

4.1.3 Water Tanks

Water tanks will be distributed at various locations across the site for fire-fighting purposes in line with CFS requirements. The tanks will be of 20 – 50 kilolitres in volume and approximately 2.95m in height.

4.1.4 Fencing

Due to the nature of the activities proposed on the site, APSP have a legislative obligation to demonstrate that the site will be appropriately secured to prevent unauthorised access. Accordingly, the proposed development will be enclosed by a 2.3m high security fence comprised of cyclone mesh (at 1.8m high) together with three strands of barbed wire measuring approximately 0.45m in height.

CCTV devices will be installed along the fence line encircling the site and will be attached to 2.5m high mounting poles. The site will be monitored using CCTV, with all buildings on-site to be alarmed.

4.1.5 Landscaping

Despite the relative isolation of the subject site, the proponent will establish landscaping along the boundaries of the subject site in order to minimise any visual impact. It is also worth noting that the solar panel footprint is likely to be significantly less than that indicated on the site plan owing to the enhanced power rating of individual solar panels available on the market by the time construction of the Project commences. This will allow panels to be sited further away from the property boundaries and adjacent landholders.

4.2 Site Management

The following sections summarise the management measures to be employed during construction of the proposed solar farm to minimise impacts. A detailed account of these measures will be included in the CEMP to be prepared by the successful construction contractor.

4.2.1 Vegetation Management

All efforts will be taken to minimise the extent of native vegetation clearance and the potential disturbance of fauna habitat. The proponent is prepared to put in place a suitable Significant Environmental Benefit (SEB) offset for native vegetation clearance that goes beyond a simple dollar payment, including the establishment of landscaping on the site periphery. The substance of this offset will be negotiated with the Native Vegetation Council.

In relation to the condition of land and vegetation post-construction, the proponent will rehabilitate the affected environment (including access tracks and laydown areas) with the aim being to return the land to its pre-construction state as much as possible.

4.2.2 Stormwater Management

A Stormwater Management Strategy prepared by Wallbridge Gilbert Aztec (WGA) for the subject site is attached as **Appendix F**.

The key points addressed within the strategy are:

- There are several water flow paths within the site including the main drainage channel along the northern boundary. This channel also has an inundation zone within the development site, it is recommended that no solar arrays be mounted within the inundation zone or within the 10m buffer around it. This zone will accommodate a drainage swale to capture runoff from the site and direct it into a retention basin.
- There are four (4) distinct catchment areas each will have its own swale which leads flows to a retention basin in the low point of the catchment. The management plan is shown in **Appendix F**.
- The approximate retention storage volumes have been listed in Table 4 with a proposed total development site basin volume of 10,800m^3.

Table 4: Total Development Site Basin Volume

CATCHMENT	AREA (ha)	WEIGHTED COEFFICIENT	TIME OF CONCENTRATION (min)	RUNOFF FLOW (m^3/s)	RETENTION BASIN VOLUME (m^3)
1 and 2 combined	271.9	0.36	57	18.5	5600
3	44.8	0.46	51	2.8	1800
4	27.3	0.66	61	3.1	3400

4.2.3 Soil Management

While there will be earthworks associated with the Project, the development of the solar farm will require some temporary stockpiling of topsoils and subsoils. Clearance will be minimised wherever possible, and stockpiles will be located away from watercourses and may be temporarily covered to reduce the potential for wind erosion.

On completion of construction activities, the stockpiled topsoil, subsoil and cleared vegetation will be re-spread over any remaining cleared areas with the site left to naturally revegetate. If the soil is unsuitable for restoration, it will be disposed of in accordance with EPA Waste Fill requirements.

A Stockpile Management Plan will be prepared by the construction contractor as part of the CEMP.

4.2.4 Dust Management

Given the prevailing climatic conditions and low rainfall experienced at the subject site, the project construction period is likely to generate some dust to levels requiring careful management in order to limit impacts on adjacent properties and public roads. Accordingly, the construction contractor will be required to specifically address soil and dust management issues in the final CEMP.

4.2.5 Heritage Management

A desktop heritage assessment conducted by Independent Heritage Consultants (IHC) is attached as **Appendix G**.

4.2.5.1 Aboriginal Heritage

A desktop study and risk assessment of the potential Aboriginal heritage constraints associated with the subject site was undertaken by IHC with a view to determining whether a cultural heritage survey of the site would be required. This assessment involved the following:

- A Taa Wikka search of the Department of Premier and Cabinet-Aboriginal Affairs and Reconciliation (DPC-AAR) Register to identify any listed Aboriginal sites;
- Review of relevant background information, including any previous heritage studies undertaken in the locality of the subject site;
- An Aboriginal heritage risk assessment associated with the development of the proposed solar farm; and
- Provision of recommendations for the management of Aboriginal heritage during development of the project to ensure compliance with the legislation.

The assessment undertaken indicates that there are no known Aboriginal heritage sites within the project area.

Considering the Aboriginal heritage context for the project area, the environmental landforms and the level of previous development, IHC has determined that there is a low risk of works encountering unknown Aboriginal sites and objects.

Although the anthropological risk is low, the groups may still have interests in the area and appreciate consultation on broader issues which fall under community engagement. Further consultation is at the discretion of the client.

Legal Obligations

- All Aboriginal heritage sites are protected under the Aboriginal Heritage Act 1988 (AHA), whether reported / registered or undocumented. Therefore, if a previously unknown Aboriginal heritage site is discovered during works and cannot be avoided, Ministerial authorisation under Section 23 of the AHA will be required.

Common Heritage Management Options

Although not mandated by the AHA, the following options can be used to mitigate heritage risk for the project;

- Implement a site discovery procedure.
- Heritage site induction
- Archaeologist on call to identify potential discoveries.

Native Title

The eastern half of the project area is within the native title claim area of the First Peoples of the Murray Mallee #2. A search of the SA Native Title Vision Web Map indicates while a claim has been accepted by the Federal Court, a determination has not yet been made.

The western half of the project area is within the native title claim area of the Ngadjuri People #2. A search of the SA Native Title Vision Web Map indicates that the Federal Court has made a determination that native title does not exist within the current project area.

There are no current registered Indigenous Land Use Agreements for the area.

4.2.5.2 European Heritage

A desktop study and risk assessment of the potential European heritage constraints associated with the subject site was undertaken by IHC to establish whether the site contains any items of

Commonwealth, State or local heritage significance. This assessment involved review of the following:

- Australian Places Inventory for places on the South Australian and Commonwealth heritage registers;
- Australian Heritage Database for World Heritage Places, National Heritage Places and Commonwealth Heritage Places;
- South Australian Heritage Places Database for places of State and local heritage significance; and
- The Register of the National Estate.

The historic heritage assessment has identified that the planned works will not impact any listed heritage places. IHC believe there is a low risk of works encountering the remains of undocumented historic heritage and archaeological features of significance.

Legal Obligations

All historic heritage and archaeological features, whether listed or not, are protected and must be managed in line with the requirements of the HPA and the PDIA.

- IHC has assessed there is a low risk of works encountering the remains of undocumented built heritage and archaeological features of heritage significance. If any heritage items are found, work should be stopped, and the finds immediately reported to Heritage SA.

Common Heritage Management Options

Although not mandated by heritage legislation, the following options can be used to manage unexpected archaeological discoveries for the project.

- The client may choose to implement a site discovery procedure during the works to account for unexpected historic heritage items and the requirements of the HPA in regard to reporting these items. This should be explained to all workers during site inductions.
- As part of this site discovery management process, the client may wish to engage archaeologists to be on call for the identification of any unexpected finds.

4.2.6 Bushfire Management

As the proposed development is located in an area of bushfire risk, the proponent has confirmed that site access points and internal access tracks will be designed to safely accommodate fire fighting vehicles and meet the requirements of the CFS. As noted, all internal access tracks, including a track circumnavigating the development, will be of all-weather construction and designed to a width of 6m. Tracks will be installed between and around the solar panels and vegetation to be retained to maximise site permeability and satisfy the requirements of the CFS. Grassed vegetation under the solar panels will be maintained to a maximum height of 100mm with panels to be set back at least 10m from areas of native vegetation to be retained.

In addition, a Bushfire Management Plan will be developed as part of the CEMP and implemented prior to construction. This plan will formalise the following measures:

On days of **catastrophic** fire danger, no work will be undertaken.

On days of **extreme** fire danger, a risk assessment will be undertaken of the work scheduled for that day to determine whether this work would constitute a serious risk in the conditions. If it is

considered that the risk can be adequately mitigated, work may proceed although no 'hot' work (angle grinding, welding and the like) will be undertaken. If the risk cannot be adequately mitigated, work will not proceed. On extreme fire danger days, it is more likely that no work will occur.

On days of **severe** fire danger, the same procedure as that for days of extreme fire danger will be implemented with no 'hot' work to be undertaken and no work at all if risks cannot be adequately mitigated. On severe fire danger days, it is more likely that work will occur with the proviso that the risk will be monitored throughout the day.

The construction contractor will be required to keep fire-fighting equipment on the subject site, including fire pumps and high-pressure hoses that can be fitted to non-combustible water tanks of between 20,000 – 50,000 litres that will be distributed at various locations around the site. Contractors will also be required to comply with CFS permits in relation to undertaking 'hot' work.

It is worth noting that the statutory requirements for electricity infrastructure to be setback well away from vegetation will be met during construction of the proposed development to minimise the risk of bushfire along the overhead transmission lines traversing the site and where the on-site substation is to be located.

4.2.7 Community Interactions

While it is envisaged that there will be few social impacts associated with the development and operation of the proposed Solar Farm, the proponent has previously in 2020 sought to engage with the surrounding community to inform them about the development and to listen to any issues raised, as discussed in the following sections.

4.2.7.1 Community Open Day

A community open day was held at the RSL Hall in Eudunda on 11 August 2020. A total of 38 people attended the open day, including Regional Council of Goyder representatives, the editor of the local newsletter, local residents and people living and / or working on properties adjacent to the proposed development. Attendees were provided with information about the solar farm and the proponent and were shown a number of images of similarly-scaled solar farm developments in order to provide a reasonably accurate picture of what the proposed development will look like on completion.

The community event was held at a time when the subject site included Lot 309 Emmaus Road. Residents in close proximity to the southern boundary of this allotment attended the open day to register their opposition to the proposal, expressing concerns over the visual impact of the solar farm and its "incompatibility" within a predominantly rural / primary production setting. Remaining participants were generally supportive of the development on the condition that any adverse impacts would be carefully managed.

Additional issues raised by attendees included:

- Likely impacts on flora and fauna;
- Impacts on local farming activities;
- Traffic impacts associated with construction of the proposed development;
- Safety during construction; and
- Likely employment impacts.

4.2.7.2 Project brochure and information sheets

A comprehensive project brochure and fact sheets were distributed to Council, surrounding residents and open day attendees providing information about the proposed development and return contact details for people seeking further information.

5.0 PLANNING ASSESSMENT

The subject site is located in the **Rural Zone** in the Planning and Design Code in an area subject to assessment against the following Overlays:

- Hazards (Bushfire - Regional)
- Hazards (Flooding - Evidence Required)
- Murray-Darling Basin
- Native Vegetation
- Water Resources

There are no Subzones that are applicable. The proposed development is not classified as a restricted form of development and will be subject to assessment against the relevant performance outcomes and designated performance outcome criteria in the Planning and Design Code (the Code).

On review of these provisions, the planning considerations of particular relevance to the assessment of the proposed solar farm include the following:

- Land use suitability and intensity;
- Flora and fauna impacts;
- Visual and landscape amenity and character;
- Traffic, access and parking arrangements;
- Soil erosion and stormwater management; and
- Bushfire hazard protection.

5.1 Land Use

The following table lists the relevant provisions of the Code as these relate to land use.

Table 5: Relevant Provisions Related to Land Use

Land Use – Assessment Provisions	
Rural Zone	
Desired Outcome 1	*A zone supporting the economic prosperity of South Australia primarily through the production, processing, storage and distribution of primary produce, forestry and the generation of energy from renewable sources.*
Desired Outcome 2	*A zone supporting diversification of existing businesses that promote value adding such as industry, storage and warehousing activities, the sale and consumption of primary produce, tourist development and accommodation.*
PO 1.1	*The productive value of rural land for a range of primary production activities and associated value adding, processing, warehousing and distribution is supported, protected and maintained.*
PO 9.1	*Renewable energy facilities and ancillary development minimises significant fragmentation or displacement of existing primary production.*

General Development Policies – Infrastructure and Renewable Energy Facilities	
Desired Outcome 1	*Efficient provision of infrastructure networks and services, renewable energy facilities and ancillary development in a manner that minimises hazard, is environmentally and culturally sensitive and manages adverse visual impacts on natural and rural landscapes and residential amenity.*
General Development Policies – Interface between Land Uses	
Desired Outcome 1	*Development is located and designed to mitigate adverse effects on or from neighbouring and proximate land uses.*

The desired outcome for the zone seeks to accommodate the long-term operation of primary industries and generation of renewable energy. While a solar farm and its associated infrastructure is not explicitly encouraged in the zone, it is considered that the proposed development is an acceptable and desired activity on the subject site given that it has been sparingly used for primary production, has limited productive value and provides few opportunities for value-adding in its current form. In addition, the proposed use is unlikely to cause any adverse impacts to neighbouring properties given its significant distance from the nearest sensitive receiver and the establishment of a landscaped buffer on the perimeter of the site.

The site is well suited to battery storage and is ideally located close to existing high-voltage transmission infrastructure to facilitate connections and minimise environmental impacts in accordance with the *Infrastructure and Renewable Energy Facilities* general development policies (see below). Furthermore, the solar farm will not prevent ongoing use of the land for grazing activities given that any grassed areas between will be retained and separation distances will provide ample space for animals to graze. It is considered that the site is capable of accommodating multiple land uses, including both the solar farm and dryland farming activities, as envisaged by the Code policies.

In summary, the Rural Zone encourages the development of renewable energy facilities where they will not unreasonably compromise primary production or result in adverse impacts on neighbouring properties or the environment more generally. Accordingly, the proposed solar farm is considered to achieve the intent of the relevant land use provisions of the Code and will have the added benefit of providing an additional 200MW of clean energy to the South Australian grid, contributing to lower energy prices while boosting job opportunities in regional South Australia.

5.2 Flora and Fauna Impacts

The following table lists the relevant provisions of the Code as these relate to potential impacts on flora and fauna.

Table 6: Relevant Provisions Related to Flora and Fauna

Flora and Fauna – Assessment Provisions	
Native Vegetation Overlay	
Desired Outcome 1	*Areas of native vegetation are protected, retained and restored in order to sustain biodiversity, threatened species and vegetation communities, fauna habitat, ecosystem services, carbon storage and amenity values.*
PO 1.1	*Development avoids, or where it cannot be practically avoided, minimises the clearance of native vegetation taking into account the siting of buildings, access points, bushfire protection measures and building maintenance.*
PO 1.2	*Native vegetation clearance in association with development avoids the following:* *(a) significant wildlife habitat and movement corridors* *(b) rare, vulnerable or endangered plant species* *(c) native vegetation that is significant because it is located in an area which has been extensively cleared* *(d) native vegetation that is growing in, or in association with, a wetland environment.*
PO 1.4	*Development restores and enhances biodiversity and habitat values through revegetation using locally indigenous plant species.*
Water Resources Overlay	
PO 1.7	*Watercourses, floodplains (1:100 AEP flood extent) and wetlands protected and enhanced by retaining and protecting existing native vegetation.*
General Development Policies – Infrastructure and Renewable Energy Facilities	
Desired Outcome 1	*Efficient provision of infrastructure networks and services, renewable energy facilities and ancillary development in a manner that minimises hazard, is environmentally and culturally sensitive and manages adverse visual impacts on natural and rural landscapes and residential amenity.*
PO 9.1	*Ground mounted solar power facilities generating 5MW or more are not located on land requiring clearance of areas of intact native vegetation or on land of high environmental, scenic or cultural value.*
PO 9.2	*Ground mounted solar power facilities allow for movement of wildlife by:* *(a) incorporating wildlife corridors and habitat refuges*

	(b) avoiding the use of extensive security or perimeter fencing or incorporating fencing that enables the passage of small animals without unreasonably compromising the security of the facility.
As noted, the proposed solar farm siting has been designed to retain and protect significant areas of native vegetation. While it is acknowledged that some limited clearance of native vegetation will be required to accommodate the development, a suitable SEB offset will be negotiated with the Native Vegetation Council. In addition, selected landscaping of the site periphery with locally indigenous plant species is planned to help screen the development and enhance the biodiversity values of the site. While the proposal will be securely fenced, openings will be provided along the site boundaries to allow for the passage of small animals, particularly around those areas of native vegetation to be retained and / or established.	

5.3 Amenity and Character

The following table lists the relevant provisions of the Code as these relate to amenity and character.

Table 7: Relevant Provisions Related to Amenity and Character

Amenity and Character – Assessment provisions	
Rural Zone	
PO 2.2	*Buildings are generally located on flat land to avoid cut and fill and the associated visual impacts.*
General Development Policies – Design	
Desired Outcome 1	*Development is:* *(a) contextual –by considering, recognising and carefully responding to its natural surroundings or built environment and positively contributes to the character of the immediate area* *(b) durable – fit for purpose, adaptable and long lasting* *(d) sustainable – by integrating sustainable techniques into the design and siting of development and landscaping to improve community health, urban heat, water management, environmental performance, biodiversity and local amenity and to minimise energy consumption.*
PO 8.1	*Development, including any associated driveways and access tracks, minimises the need for earthworks to limit disturbance to natural topography.*
General Development Policies – Infrastructure and Renewable Energy Facilities	
Desired Outcome 1	*Efficient provision of infrastructure networks and services, renewable energy facilities and ancillary development in a manner that minimises hazard, is environmentally and culturally sensitive and that suitably*

	manages adverse visual impacts on natural and rural landscapes and residential amenity.
PO 1.1	*Development is located and designed to minimise hazard or nuisance to adjacent development and land uses.*
PO 2.1	*The visual impact of above-ground infrastructure networks and services (excluding high voltage transmission lines), renewable energy facilities (excluding wind farms), energy storage facilities and ancillary development is minimised from townships, scenic routes and public roads by:* *(a) utilising features of the natural landscape to obscure views where practicable* *(b) siting development below ridgelines where practicable* *(c) avoiding visually sensitive and significant landscapes* *(d) using materials and finishes with low-reflectivity and colours that complement the surroundings* *(e) using existing vegetation to screen buildings* *(f) incorporating landscaping or landscaped mounding around the perimeter of a site and between adjacent allotments accommodating or zoned to primarily accommodate sensitive receivers.*
PO 2.2	*Pumping stations, battery storage facilities, maintenance sheds and other ancillary structures incorporate vegetation buffers to reduce adverse visual impacts on adjacent land.*
PO 2.3	*Surfaces exposed by earthworks associated with the installation of storage facilities, pipework, penstock, substations and other ancillary plant are reinstated and revegetated to reduce adverse visual impacts on adjacent land.*
PO 3.1	*Progressive rehabilitation (incorporating revegetation) of disturbed areas, ahead of or upon decommissioning of areas used for renewable energy facilities and transmission corridors.*
PO 5.1	*Electricity infrastructure located to minimise visual impacts through techniques including:* *(a) siting utilities and services:* *i. on areas already cleared of native vegetation* *ii. where there is minimal interference or disturbance to existing native vegetation or biodiversity.*
PO 5.3	*Battery storage facilities co-located with substation infrastructure where practicable to minimise the development footprint and reduce environmental impacts.*
PO 7.1	*Renewable energy facilities are located as close as practicable to existing transmission infrastructure to facilitate connections and minimise environmental impacts as a result of extending transmission infrastructure.*

PO 9.1	*Ground mounted solar power facilities generating 5MW or more are not located on land requiring clearance of areas of intact native vegetation or on land of high environmental, scenic or cultural value.*
PO 9.3	*Amenity impacts of solar power facilities are minimised through separation from conservation areas and sensitive receivers in other ownership.*
PO 9.4	*Ground mounted solar power facilities incorporate landscaping within setbacks from adjacent road frontages and boundaries of adjacent allotments accommodating non-host dwellings, where balanced with infrastructure access and bushfire safety considerations.*
PO 13.1	*In rural and remote locations, development that is likely to generate significant waste material during construction, including packaging waste, makes provision for a temporary on-site waste storage enclosure to minimise the incidence of wind-blown litter.*
PO 13.2	*Temporary facilities to support the establishment of renewable energy facilities (including borrow pits, concrete batching plants, laydown, storage, access roads and worker amenity areas) are sited and operated to minimise environmental impact.*
General Development Policies – Interface between Land Uses	
PO 1.2	*Development adjacent to a site containing a sensitive receiver (or lawfully approved sensitive receiver) or zone primarily intended to accommodate sensitive receivers is designed to minimise adverse impacts.*
PO 2.1	*Non-residential development does not unreasonably impact the amenity of sensitive receivers (or lawfully approved sensitive receivers) or an adjacent zone primarily for sensitive receivers through its hours of operation having regard to:* *(a) the nature of the development* *(b) measures to mitigate off-site impacts* *(c) the extent to which the development is desired in the zone.*
PO 4.1	*Development that emits noise (other than music) does not unreasonably impact the amenity of sensitive receivers (or lawfully approved sensitive receivers).*
PO 4.2	*Areas for the on-site manoeuvring of service and delivery vehicles, plant and equipment, outdoor work spaces (and the like) are designed and sited to not unreasonably impact the amenity of adjacent sensitive receivers (or lawfully approved sensitive receivers) and zones primarily intended to accommodate sensitive receivers due to noise and vibration by adopting techniques including:* *(b) when sited outdoors, locating such areas as far as practicable from adjacent sensitive receivers and zones primarily intended to accommodate sensitive receivers.*

PO 6.1	*External lighting is positioned and designed to not cause unreasonable light spill impact on adjacent sensitive receivers (or lawfully approved sensitive receivers).*
PO 7.1	*Development designed and comprised of materials and finishes that do not unreasonably cause a distraction to adjacent road users and pedestrian areas or unreasonably cause heat loading and micro-climatic impacts on adjacent buildings and land uses as a result of reflective glare.*
The proposed solar farm and associated infrastructure has been designed to sit comfortably within the existing landscape context while minimising its environmental impact. Earthworks will be limited to the development of the on-site substation, footings for the solar arrays and some minor trenching to accommodate cabling. All disturbed areas, including parking and laydown areas, will be rehabilitated on completion of construction. There will be little noise associated with the development and external lighting will be directed towards the substation which is located at least 2.2km away from the nearest residence. The visual impact of the solar farm and associated infrastructure will be negligible given its location on land of limited scenic, environmental and cultural value well away from sensitive receivers. With the incorporation of landscaping along the site boundaries and low levels of traffic on surrounding roads, the development is unlikely to cause any off-site visual impacts. The location of the on-site substation close to the existing 275kV transmission line will further reduce the visual impact of the development as it will negate the need for additional overhead transmission lines to connect to the grid. All waste materials arising from the construction will be securely stored on-site prior to disposal. The site will be rehabilitated on de-commissioning of the solar farm with the aim being to return the land to its pre-construction state as much as possible. Accordingly, the proposed development is considered to meet the intent of the amenity and character provisions of the Code.	

5.4 Traffic, Access and Parking

The following table lists the relevant provisions of the Code as these relate to traffic, access and parking.

Table 8: Relevant Provisions Related to Traffic, Access and Parking

Traffic, Access and Parking – Assessment provisions	
Rural Zone	
PO 2.1	*Development is provided with suitable vehicle access.*
Hazards (Bushfire Regional) Overlay	
Desired Outcome 2	*To facilitate access for emergency service vehicles to aid the protection of lives and assets from bushfire danger.*
PO 5.1	*Roads are designed and constructed to:*

	(a) facilitate the safe and effective: *i. use, operation and evacuation of fire-fighting and emergency personnel* *ii. evacuation of residents* *(b) avoid the unnecessary clearance of native vegetation.*
PO 5.2	*Where the furthest point of the building from the nearest public road is greater than 30m, driveways are designed and constructed to:* *(a) facilitate the safe and effective:* *i. use, operation and evacuation of fire-fighting and emergency personnel and* *ii. evacuation of residents* *(b) avoid the unnecessary clearance of native vegetation.*
General Development Policies – Design	
PO 7.6	*Vehicle parking areas and associated driveways are landscaped to shade and positively contribute to amenity.*
General Development Policies – Transport, Access and Parking	
Desired Outcome 1	*A comprehensive, integrated and connected transport system that is safe, sustainable, efficient, convenient and accessible to all users.*
PO 1.1	*Development is integrated with the existing transport system and designed to minimise its potential impact on the functional performance of the transport system.*
PO 1.2	*Development is designed to discourage commercial and industrial vehicle movements through residential streets and adjacent other sensitive receivers.*
PO 1.4	*Development sited and designed so that loading, unloading and turning of all traffic avoids interrupting the operation of and queuing on public roads and pedestrian paths.*
PO 2.1	*Sightlines at intersections, pedestrian and cycle crossings, and crossovers to allotments for motorists, cyclists and pedestrians are maintained or enhanced to ensure safety for all road users and pedestrians.*
PO 3.1	*Safe and convenient access minimises impact or interruption on the operation of public roads.*
PO 3.3	*Access points are sited and designed to accommodate the type and volume of traffic likely to be generated by the development or land use.*
PO 3.4	*Access points are sited and designed to minimise any adverse impacts on neighbouring properties.*
PO 3.8	*Driveways, access points, access tracks and parking areas are designed and constructed to allow adequate movement and manoeuvrability having regard to the types of vehicles that are reasonably anticipated.*

PO 3.9	*Development is designed to ensure vehicle circulation between activity areas occurs within the site without the need to use public roads.*
PO 5.1	*Sufficient on-site vehicle parking and specifically marked accessible car parking places are provided to meet the needs of the development or land use having regard to factors that may support a reduced on-site rate such as:* *(a) availability of on-street car parking* *(b) shared use of other parking areas.*
PO 6.2	*Vehicle parking areas are appropriately located, designed and constructed to minimise impacts on adjacent sensitive receivers through measures such as ensuring they are attractively developed and landscaped, screen fenced, and the like.*
PO 6.6	*Loading areas and designated parking spaces for service vehicles are provided within the boundary of the site.*
Suitable vehicle access is proposed to be provided to the subject site via two routes, both of which are supported by Council and DIT. The proponent will implement recommended improvements to intersections on both routes to safely accommodate turning movements for heavy vehicles transporting project infrastructure to the site. These improvements and the design of both site access points will also facilitate access and operation of fire fighting vehicles in the event of a fire. The proposed routes and access points will safely accommodate the volume of commercial and private vehicles expected during the construction, operation and decommissioning stages of the project without adversely affecting the functional performance of the surrounding road network or neighbouring properties. All loading and unloading will occur within the subject site with internal access tracks and parking areas designed to safely accommodate vehicle movements with minimal native vegetation clearance. While the parking area will not be specifically landscaped, plantings on the site boundaries will assist in screening the development from surrounding roads and adjacent properties. A Traffic Management Plan will be prepared by the construction contractor and submitted to Council and DIT prior to works commencing.	

5.5 Soil Erosion and Stormwater Management

The following table lists the relevant provisions of the Code as these relate to stormwater management and the prevention of soil erosion.

Table 9: Relevant Provisions Related to Soil Erosion and Stormwater Management

Soil Erosion and Stormwater Management – Assessment provisions	
Hazards (Flooding – Evidence Required) Overlay	
Desired Outcome 1	*Development adopts a precautionary approach to mitigate potential impacts on people, property, infrastructure and the environment from*

	potential flood risk through the appropriate siting and design of development.
PO 1.1	*Development is sited, designed and constructed to minimise the risk of entry of potential floodwaters where the entry of flood waters is likely to result in undue damage to or compromise ongoing activities within buildings.*
PO 2.1	*Buildings and structures used either partly or wholly to contain or store hazardous materials are designed to prevent spills or leaks leaving the confines of the building.*
Murray-Darling Basin Overlay	
Desired Outcome 1	*Sustainable water use in the Murray-Darling Basin area.*
Water Resources Overlay	
Desired Outcome 1	*Protection of the quality of surface waters considering adverse water quality impacts associated with projected reductions in rainfall and warmer air temperatures as a result of climate change.*
Desired Outcome 2	*Maintain the conveyance function and natural flow paths of watercourses to assist in the management of flood waters and stormwater runoff.*
PO 1.1	*Watercourses and their beds, banks, wetlands and floodplains (1% AEP flood extent) are not damaged or modified and are retained in their natural state, except where modification is required for essential access or maintenance purposes.*
PO 1.5	*Development that increases surface water run-off includes a suitably sized strip of vegetated land on each side of a watercourse to filter runoff to:* *(a) reduce the impacts on native aquatic ecosystems* *(b) minimise soil loss eroding into the watercourse.*
PO 1.7	*Watercourses, floodplains (1% AEP flood extent) and wetlands protected and enhanced by retaining and protecting existing native vegetation.*
PO 1.8	*Watercourses, floodplains (1% AEP flood extent) and wetlands are protected and enhanced by stabilising watercourse banks and reducing sediments and nutrients entering the watercourse.*
General Development Policies – Design	
PO 5.1	*Development is sited and designed to maintain natural hydrological systems without negatively impacting:* *(a) the quantity and quality of surface and groundwater* *(b) the depth and directional flow of surface water and groundwater* *(c) the quality and function of natural springs.*

PO 31.2	*Water discharged from a development site is of a physical, chemical and biological condition equivalent to or better than its pre-developed state.*

The stormwater management strategy for the development has been designed to preserve natural flow rates to pre-development levels and prevent downstream erosion, flooding and nuisance in accordance with the above provisions of the Code.

As the solar farm will not impede the natural flow of water across the site or change the topography of the subject land, it is anticipated that the quality of surface water discharging from the site will not change. Grassed areas between the panels, retention of vegetation alongside watercourses and the installation of detention basins and swales on the site boundaries will capture any sediment runoff, effectively minimising soil erosion while maintaining the integrity of existing watercourses on-site.

There are several water flow paths within the site including the main drainage channel along the northern boundary. This channel also has an inundation zone within the development site, it is recommended that no solar arrays be mounted within the inundation zone or within the 10m buffer around it. This zone will accommodate a drainage swale to capture runoff from the site and direct it into a retention basin.

There are four (4) distinct catchment areas each will have its own swale which leads flows to a retention basin in the low point of the catchment in accordance with an engineered management plan as detailed in Appendix B to this report.

The approximate retention storage volumes to accommodate the proposed development will be capable of accommodating a site basin volume of 10,800m^3.

The site substation will be sited and designed in accordance with legislative requirements to prevent the entry of floodwaters.

A Soil Erosion Management Plan (SEMP) will be prepared by the construction contractor as part of the CEMP to manage erosion and water quality throughout the construction phase of the development.

5.6 Bushfire Hazard Protection

The following table lists the relevant provisions of the Code as these relate to bushfire hazard protection.

Table 10: Relevant Provisions Related to Bushfire Hazard Protection

Bushfire Hazard Protection – Assessment provisions	
Hazards (Bushfire Regional) Overlay	
Desired Outcome 1	*Development, including land division, responds to the relevant level of bushfire risk and is sited and designed to mitigate the threat and impact of bushfires on life and property taking into account the increased frequency and intensity of bushfires as a result of climate change.*

Desired Outcome 2	*To facilitate access for emergency vehicles to aid the protection of lives and assets from bushfire danger.*
PO 1.1	*Buildings and structures are located away from areas that pose an unacceptable bushfire risk as a result of vegetation cover and type, and terrain.*
PO 2.1	*Buildings and structures are designed and configured to reduce the impact of bushfire through using designs that reduce the potential for trapping burning debris against or underneath the building or structure, or between the ground and building floor level in the case of transportable buildings and buildings on stilts.*
PO 5.1	*Roads are designed and constructed to facilitate the safe and effective:* *(a) access, operation and evacuation of fire-fighting and emergency personnel* *(b) evacuation of residents, occupants and visitors.*
PO 5.3	*Development does not rely on fire tracks as a means of evacuation or access for fire-fighting purposes unless there are no safe alternatives available.*
General Development Policies – Infrastructure and Renewable Energy Facilities	
PO 1.1	*Development is located and designed to minimise hazard or nuisance to adjacent development and land uses.*
PO 4.2	*Facilities for energy generation, power storage and transmission are separated as far as practicable from dwellings, tourist accommodation and frequently visited public places (such as viewing platforms/lookouts) to reduce risks to public safety from fire or equipment malfunction.*
PO 4.3	*Bushfire hazard risk is minimised for renewable energy facilities by providing appropriate access tracks, safety equipment, and water tanks and establishing cleared areas around substations, battery storage and operations compounds.*

As the proposal is located in an area of bushfire risk, site access points and internal access tracks have been designed to safely accommodate fire-fighting vehicles and meet the requirements of the CFS. As noted, all internal access tracks, including a track circumnavigating the development and those sited between solar arrays, will be 6m wide and of all-weather construction facilitating access to all parts of the solar farm in the event of a fire. Vegetation under the solar panels will be maintained to a maximum height of 100mm with panels to be setback at least 10m from areas of native vegetation to further minimise the bushfire risk.

In addition, the construction contractor will be required to keep fire-fighting equipment on-site, including high-capacity water tanks, pumps and high-pressure hoses. The contractor will also develop and implement a Bushfire Management Plan and will comply with CFS permit requirements for undertaking 'hot' work.

As a final point, the solar farm and associate infrastructure have been designed to prevent burning debris from being trapped against the building.

6.0 MANAGING ENVIRONMENTAL IMPACTS

The following sections discuss and summarise the environmental assessments undertaken to support the project.

6.1 Ecological Assessment

EBS Ecology (EBS) was commissioned to complete a number of ecological assessments of the subject site. An initial assessment of the Bower Road and Emmaus Road allotments was undertaken in February 2020 to flag potential ecological constraints for the project and guide the siting and placement of the PV panels and associated infrastructure to avoid significant vegetation, threatened ecological communities (TECs) and important fauna habitat. A detailed spring survey of the Bower Road allotment was undertaken in October 2020 and again in October 2023 to inform any required native vegetation clearance approval documentation while a detailed ecological assessment of 91 Mickan Road was completed in May 2021. The assessment undertaken by EBS for the development application is included at **Appendix H**.

7.0 CONCLUSION

Green Gold Energy is seeking to develop a solar farm at a site located approximately 16.2 km north-east of the township of Eudunda in the Regional Council of Goyder.

Certification from the OTR certifying that the proposed development complies with the requirements of the Technical Regulator in relation to the security and stability of the State's power system has been secured.

The proposed development aligns with State and Commonwealth government strategies and the level of investment anticipated to build and operate the Solar Farm will make a significant contribution to the local economy through increased employment and demand for a range of goods and supporting services.

The early planning phase for the project has sought to identify and understand potential impacts and incorporate measures to mitigate these impacts to the extent practicable, such as retention of native vegetation, development of detention basins to control and contain stormwater and improvements to intersections along Worlds End Highway.

Potential construction impacts will be managed by incorporating appropriate measures to oversee the construction phase in an environmentally responsible manner, avoid degradation of the landscape and promote safe and efficient construction practices and procedures.

Once constructed, the proposed solar farm will have minimal impacts on the surrounding environment.

Based on an assessment of the proposed development against the relevant provisions of the Planning and Design Code, the proposed development is not considered to be significantly at variance with the Code and warrants approval.

Planning Aspects Pty Ltd
PO Box 986
Kensington Gardens SA 5068

0418 856 580
shanti.ditter@planningaspects.com
www.planningaspects.com

ABN 55 114 897 335

1 May 2024

Ms Fiona Selleck
Senior Planning Officer
Crown and Impact Assessment
Planning and Land Use Services
Department for Trade and Investment
83 Pirie Street
Adelaide SA 5000

Dear Fiona

Re: Crown Development Application 24003878 Australia Plains Solar Facility

I refer to the subject Development Application and confirm as advised by email that the proposal is to be expanded from a 150MW solar array to a 200MW solar array, comprising an additional 9172 solar panels. The additional panels are to be sited on the south eastern side of the site and immediately to the east of the site of the BESS which has now received an exemption certificate for its development.

In support of the additional area, I enclose for your records revised:

- site plan and layout
- stormwater management plan that addresses the expanded area
- ecological assessment that addresses the expanded area
- Crown sponsorship
- Confirmation from the OTR

The planning assessment, heritage impact assessment and traffic impact assessment reports as a result of the expanded areas do not change. Please let me know if you need any additional information in support of this DA. Should you have any further queries regarding the proposal, please do not hesitate to contact me on 0418856580.

Kind regards,

Shanti Ditter
Principal

Appendix A

Government of South Australia
Department for Energy and Mining

Ref: 2023D067667

Energy and Technical Regulation

Office of the Technical Regulator

Level 8, 11 Waymouth Street
Adelaide SA 5000

GPO Box 320
Adelaide SA 5001

Telephone: 08 8226 5500
Facsimile: 08 8226 5866

otr.sa.gov.au

8 August 2023

Alessandro Wei
Green Gold Energy
216 Glen Osmond Rd
Fullarton SA 5063

Dear Mr Wei,

RE: Australia Plains Solar and Battery Storage Project

The development of the Australia Plains Solar and Battery Storage Project has been assessed by the Office of the Technical Regulator (OTR) under section 122 of the *Planning, Development and Infrastructure Act 2016.*

The *Planning, Development and Infrastructure (General) Regulations 2017* prescribe if the proposed development is for the purposes of the provision of electricity generating plant with a generating capacity of more than 5 MW that is to be connected to the State's power system – a certificate from the Technical Regulator is required, certifying that the proposed development complies with the requirements of the Technical Regulator in relation to the security and stability of the State's power system.

In making a decision on your application, our office has taken the following information into account:

- Your letter received 26th July 2023.
- The single line diagram for the project.

After assessing the information provided, I advise that approval is granted for the project on the condition that the inertia/fast frequency response (FFR) requirements shall be met via one of the following solutions:

- A minimum of 411MW.s of real inertia is provided via a synchronous condenser solution.
- 71MW of FFR to be provided via a battery energy storage system (BESS) solution.
- A combination of real inertia and FFR that satisfies the OTR requirements.

It should be noted that should the proponent subsequently decide not to construct the BESS or synchronous condenser, as outlined in the Development Application (DA) and agreed to in this certificate, the proponent is advised that they must apply for a variation to the DA. Any such variation will require the proponent to obtain a new certificate from the OTR. If a certificate is not obtained, formal referral to the OTR will be required during the DA assessment process. Any formal referral may be subject to referral fees applicable at the time.

I understand you wish to apply for a 12 month grace period between energisation of the solar farm, and availability of the FFR/inertia solution. Typically, the OTR would consider a gap of no more than 6 months to be reasonable. In this instance however, I am prepared to grant an extension of 12 months, that being, it is expected that the FFR/inertia solution shall be in commercial operation no later than 12 months following the first commercial operation of the 150MW solar farm.

Should you have any questions regarding this matter, please do not hesitate to call Mark Burns on (08) 8429 2707.

Yours sincerely

Rob Faunt
TECHNICAL REGULATOR

Government of South Australia
Department for Energy and Mining

Ref: 2024D024686

Regulation and Compliance

Office of the Technical Regulator

Level 8, 11 Waymouth Street
Adelaide SA 5000

GPO Box 320
Adelaide SA 5001

Telephone: 08 8226 5500
Facsimile: 08 8226 5866

www.otr.sa.gov.au

2 April 2024

Alessandro Wei
Green Gold Energy
216 Glen Osmond Rd
Fullarton SA 5063

Dear Mr Wei,

RE: Australia Plains Solar and Battery Storage Project

The development of the Australia Plains Solar and Battery Storage Project has been assessed by the Office of the Technical Regulator (OTR) under section 122 of the *Planning, Development and Infrastructure Act 2016.*

The *Planning, Development and Infrastructure (General) Regulations 2017* prescribe if the proposed development is for the purposes of the provision of electricity generating plant with a generating capacity of more than 5 MW that is to be connected to the State's power system – a certificate from the Technical Regulator is required, certifying that the proposed development complies with the requirements of the Technical Regulator in relation to the security and stability of the State's power system.

In deciding on your application, I have taken the following information into account:

- Your letter received 20th March 2024.

After assessing the information provided, I advise that approval is granted for the project on the condition that 94.5MW of fast frequency response (FFR) shall be provided by the 200MW/400MWh battery energy storage system (BESS).

It should be noted that should the proponent subsequently decide not to construct the BESS, as outlined in the Development Application (DA) and agreed to in this certificate, the proponent is advised that they must apply for a variation to the DA. Any such variation will require the proponent to obtain a new certificate from the OTR. If a certificate is not obtained, formal referral to the OTR will be required during the DA assessment process. Any formal referral may be subject to referral fees applicable at the time.

I understand you wish to apply for a 12-month grace period between energisation of the solar farm, and availability of the FFR. Typically, the OTR would consider a gap of no more than 6 months to be reasonable. In this instance however, I am prepared to grant an extension of 12 months, that being, it is expected that the FFR solution shall be in commercial operation no later than 12 months following the first commercial operation of the 200MW solar farm.

Should you have any questions regarding this matter, please do not hesitate to call Mark Burns on (08) 8429 2707.

Yours sincerely

Rob Faunt
TECHNICAL REGULATOR

Regulation and Compliance

Level 8, 11 Waymouth Street Adelaide SA 5000 | GPO Box 320 Adelaide SA 5001 | DX541
Tel (+61) 8 8226 5500 | Fax (+61) 8 8226 5866 | www.dpc.sa.gov.au | ABN 83 524 915 929

Appendix B

Government of South Australia

Department for Energy and Mining

Our Ref: 2023D073376

Mr Elton Zhang
Project Coordinator
Green Gold Energy
216 Glen Osmond Rd
FULLARTON SA 5063

Via email: elton.zhang@greengoldenergy.com.au
donnaferretti@bigpond.com

Cc: mary.lavelle@sa.gov.au

Dear Mr Zhang

CROWN SPONSORSHIP FOR GREEN GOLD ENERGY'S AUSTRALIA PLAINS SOLAR FARM AND BATTERY PROJECT

Thank you for the correspondence dated 25 August 2023 requesting Crown sponsorship under section 131 of the *Planning, Development and Infrastructure Act 2016* to assist with Green Gold Energy's proposed Australia Plains Solar Farm and Battery Project (the project).

The project has been considered by the Department for Energy and Mining (DEM) with input from the Department for Infrastructure and Transport, the Department of Trade and Investment (Planning and Land Use Services), the Department for Environment and Water, and the Environment Protection Authority. In principle, the project is supported, recognising the possible environmental and community issues that will need to be addressed through the development assessment process.

On balance, the development of Green Gold Energy's proposed project has the potential to benefit South Australia and can be considered essential infrastructure.

Accordingly, I, as Chief Executive of the Department for Energy and Mining (DEM), will support the development and specifically endorse a development application to assess the project, comprising 300MW battery with 4 hours of storage, 150MW of solar panels and ancillary equipment at Australia Plains, as a development of 'essential infrastructure' under section 131(2)(c) of the *Planning, Development and Infrastructure Act 2016*.

Chief Executive
Address Level 12, 11 Waymouth Street, Adelaide 5000 | GPO Box 320 Adelaide SA 5001 | DX452
Tel (+61) 08 8429 3216 | Email DEM.OCE@sa.gov.au | www.energymining.sa.gov.au | ABN 83 768 683 934

SOUTH AUSTRALIA

Government of South Australia

Department for Energy and Mining

It is the responsibility of Green Gold to prepare all documentation as required by the relevant Act. This includes all costs in the preparation, lodgement and assessment of the development application and any other subsequent action in relation to this application.

A development application must be submitted to DEM's Growth and Low Carbon Division (glc@sa.gov.au) who will lodge it with the State Commission Assessment Panel (SCAP). These lodgement documents can be provided in electronic form or made available via download link. Any development fee levied by SCAP is the responsibility of Green Gold Energy.

It is also a requirement that you contact Ms Mary Lavelle, Industry Analyst on 08 8429 3515 or via email at mary.lavelle@sa.gov.au prior to the lodgement of the development application to ensure all relevant statutory requirements are met.

DEM makes no representations and gives no warranties in relation to the outcome of the development application or time that it takes to secure a planning outcome. It is the responsibility of Green Gold Energy to obtain all other statutory approvals, licences, connection agreements and permits from relevant authorities; manage community expectations; and to fund the project. The Government of South Australia makes no commitment to purchase any product or service related to the project.

If the development application has not been received electronically, by mail or in person by the SCAP within 12 months from the date of this letter, my support for this Crown sponsorship under section 131(2)(c) of the *Planning, Development and Infrastructure Act 2016* will lapse.

Yours sincerely

Paul Heithersay PSM
CHIEF EXECUTIVE
4/10/2023

Chief Executive

Address Level 12, 11 Waymouth Street, Adelaide 5000 | GPO Box 320 Adelaide SA 5001 | DX452

Tel (+61) 08 8429 3216 | Email DEM.OCE@sa.gov.au | www.energymining.sa.gov.au | ABN 83 768 683 934

SOUTH AUSTRALIA

Government of South Australia
Department for Energy and Mining

DEMC24/00487

Mr Elton Zhang
Project Coordinator
Green Gold Energy
216 Glen Osmond Rd
FULLARTON SA 5063

Via email: elton.zhang@greengoldenergy.com.au
Cc: mary.lavelle@sa.gov.au

Dear Mr Zhang

CROWN SPONSORSHIP FOR GREEN GOLD ENERGY'S AUSTRALIA PLAINS SOLAR FARM PROJECT

I refer to my letter dated 14 November 2023 (Our Ref: 2023D093639), sent in response to your request for Crown sponsorship of Green Gold Energy's proposed Australia Plains Solar Farm and Battery Project under section 131 of the *Planning, Development and Infrastructure Act 2016* (PDI Act).

I note that the solar component of the project has increased in size from 150 MW to 200 MW and that the Battery Energy Storage System (BESS) component has been granted an exemption under Schedule 13 of the Planning, Development and Infrastructure (General) Regulations 2017.

Accordingly, I, as Chief Executive of the Department for Energy and Mining, continue to support the development and specifically endorse a development application to assess a solar farm, comprising a 200 MW solar farm and associated infrastructure at Australia Plains as a development of 'essential infrastructure' under section 131(2)(c) of the PDI Act, as per my letter dated 14 November 2023, noting the change in capacity of the solar farm and exemption from development assessment for the BESS.

Yours sincerely

Paul Heithersay PSM
CHIEF EXECUTIVE

23 / 4 / 2024

Chief Executive
Address Level 12, 11 Waymouth Street, Adelaide 5000 | GPO Box 320 Adelaide SA 5001 | DX452
Tel (+61) 08 8429 3216 | Email DEM.OCE@sa.gov.au | www.energymining.sa.gov.au | ABN 83 768 683 934

SOUTH AUSTRALIA

REAL PROPERTY ACT, 1886
South Australia

The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.

Certificate of Title - Volume 5972 Folio 348

Parent Title(s) CL 902/20

Creating Dealing(s) RLG 10523113

Title Issued 06/10/2006 **Edition** 4 **Edition Issued** 29/05/2019

Estate Type

FEE SIMPLE

Registered Proprietor

BOWER FORTUNE PTY LTD (ACN: 632 692 409)
OF 105 KING WILLIAM STREET KENT TOWN SA 5067

Description of Land

SECTION 315
HUNDRED OF ENGLISH
IN THE AREA NAMED AUSTRALIA PLAINS

Easements

NIL

Schedule of Dealings

Dealing Number	Description
5005483	LEASE COMMENCING ON 11/1/1983 AND EXPIRING ON 10/1/2082 OF AN EASEMENT OVER PORTION AS TO THE SHARES SPECIFIED THEREIN (SUBJECT TO LEASE 9061500 OF THE INTEREST OF TRANSMISSION LESSOR CORPORATION)

Notations

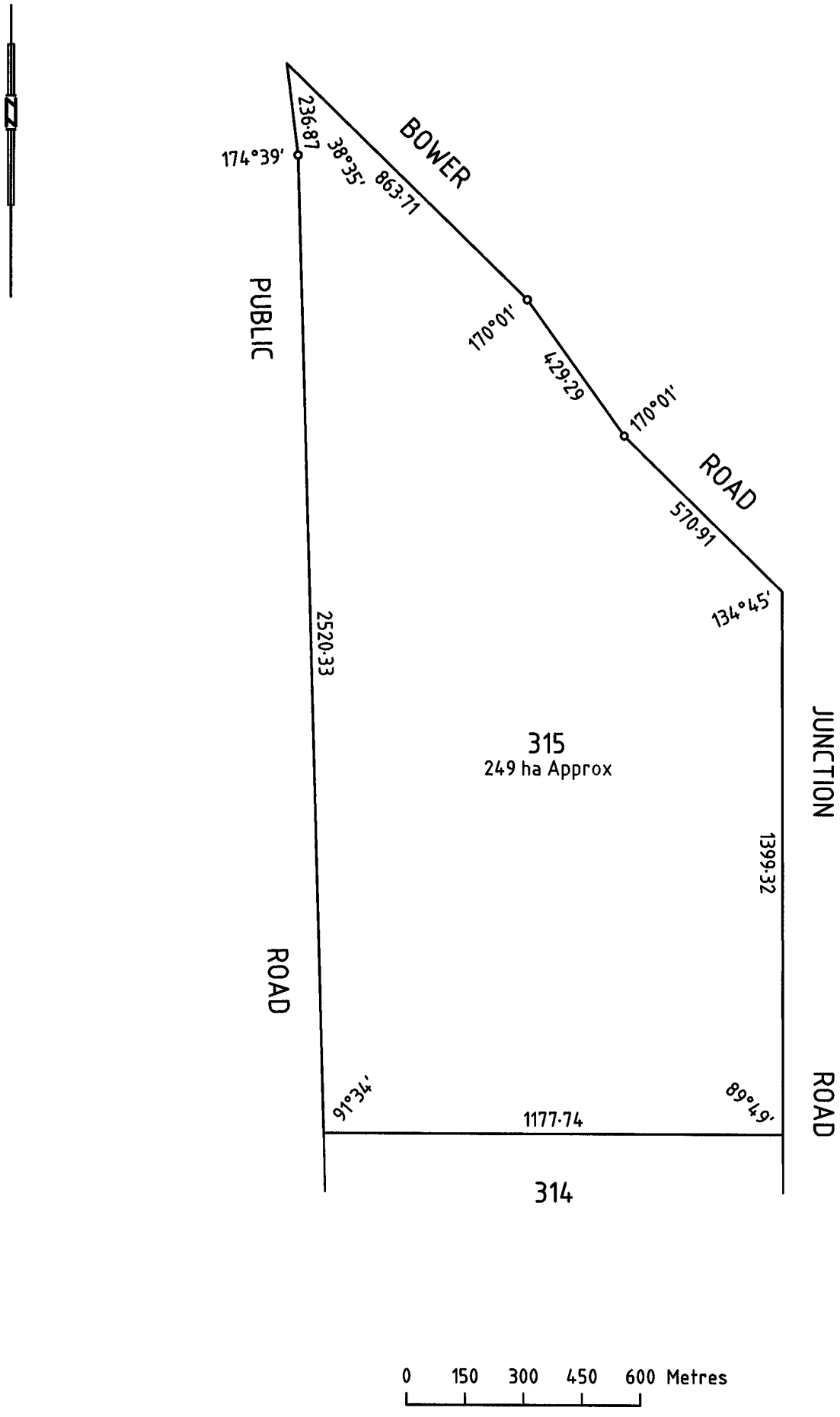
Dealings Affecting Title NIL

Priority Notices NIL

Notations on Plan NIL

Registrar-General's Notes NIL

Administrative Interests NIL



REAL PROPERTY ACT, 1886
South Australia

The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.

Certificate of Title - Volume 5907 Folio 538

Parent Title(s)	CL 659/88				
Creating Dealing(s)	RLG 9727100				
Title Issued	26/11/2003	**Edition**	6	**Edition Issued**	18/02/2021

Estate Type

FEE SIMPLE

Registered Proprietor

BOWER FORTUNE PTY. LTD. (ACN: 632 692 409)
OF PO BOX 3560 NORWOOD SA 5067

Description of Land

SECTION 57
HUNDRED OF BOWER
IN THE AREA NAMED AUSTRALIA PLAINS

Easements

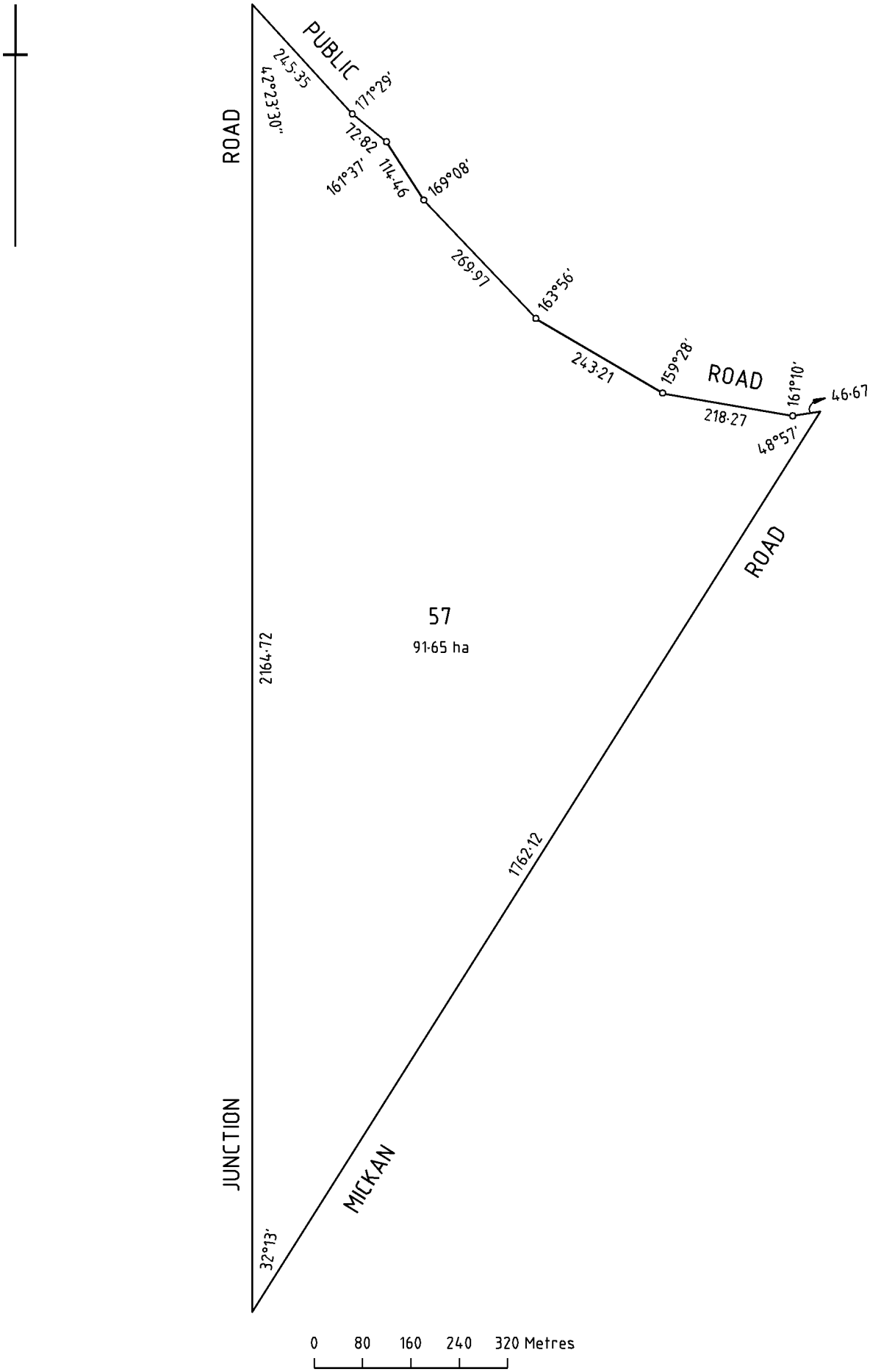
NIL

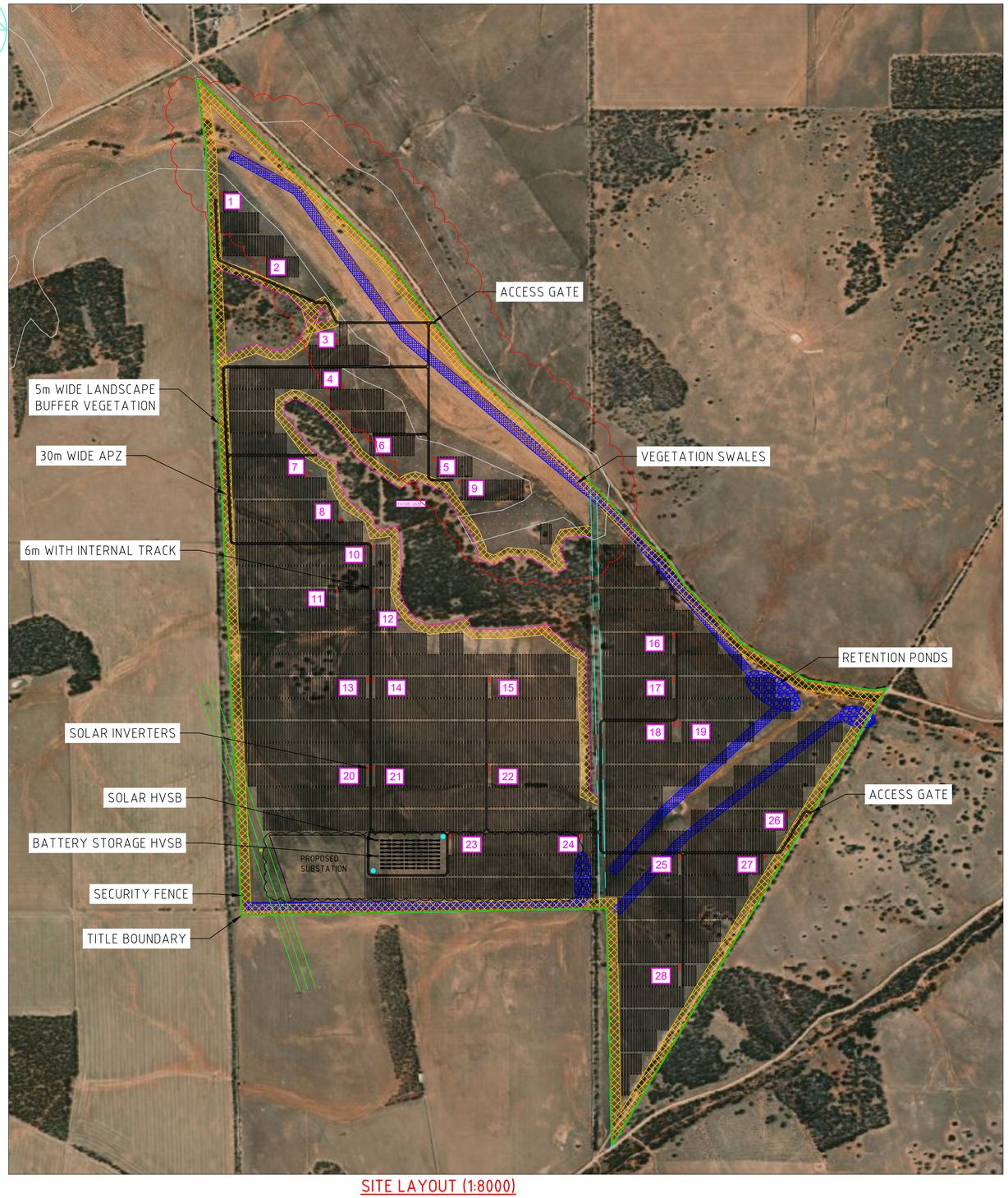
Schedule of Dealings

NIL

Notations

Dealings Affecting Title	NIL
Priority Notices	NIL
Notations on Plan	NIL
Registrar-General's Notes	NIL
Administrative Interests	NIL





SITE LAYOUT (1:8000)

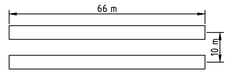
NOTES

1. ACTUAL DIMENSIONS AND CLEARANCES MAY VARY SUBJECT TO SITE CONDITIONS.
2. DIMENSIONS OF ELECTRICAL EQUIPMENT ARE INDICATIVE ONLY. ACTUAL DIMENSIONS TO BE CONFIRMED.
3. EXISTING SAPN POLE IS FOR ILLUSTRATION ONLY. ACTUAL POSITION IS SUBJECT TO THE ACTUAL MEASUREMENT ON SITE.
4. TWO NEW POLES WILL BE INSTALLED TO CARRY OVERHEAD TRANSMISSION LINES AND CONNECT TO ESSENTIAL ENERGY NETWORK.
5. SITE STORAGE AND AMENITY FACILITIES TO BE ON SITE ONLY DURING CONSTRUCTION PHASE. NO PERMANENT BUILDINGS TO BE KEPT ON SITE AFTER CONSTRUCTION COMPLETED.
6. A TURNKEY BATTERY PCU CONSISTS OF 2 INVERTER MODULES AND 1 TRANSFORMER.

LEGEND

- PROPOSED PV ARRAY
- SECURITY FENCE
- PROPERTY BOUNDARY
- RESERVED AREA FOR VEGETATION
- POTENTIAL WATER PATHS
- ELECTRANET EASEMENT
- VEGETATION SWALES
- STORMWATER RETENTION PONDS
- FIREFIGHTING WATER TANKS
- ASSET PROTECTION ZONE
- INUNDATION ZONE

TYPICAL BATTERY & INVERTER UNIT



108-MODULE 2 PORTRAIT TRACKER

SYSTEM SPECIFICATIONS				
DC	188.15	MW	TOTAL MODULES	276696
MODULE CAPACITY	680	W	MODULES PER STRING	27
NUMBER OF SOLAR INVERTERS	28	-	NUMBER OF STRINGS	10432
SOLAR MVPS MODEL	INGECON-7650-FSK-C	-	MODULE MODEL	LR5-72HTH-680M
BATTERY INVERTER MODEL	INGECON-3930-TL	-	NUMBER OF BATTERY INVERTERS	80
BATTERY CAPACITY	400	MWh	BATTERY MODEL	TBD

FOR INFORMATION

No	DATE	DRN	CHK	ENG	Q.A.	PROJECT	DESCRIPTION	NUMBER	TITLE
L	02/09/24	DS	ACE	DS	ACE	APSP	UPDATE LANDSCAPE		
K	29/05/24	DS	ACE	DS	ACE	APSP	UPDATE BUSHFIRE REQUIREMENTS		
J	09/05/24	MG	ACE	MG	ACE	APSP	BESS UPDATES		
I	26/04/24	MG	ACE	MG	ACE	APSP	UPDATE BESS		
H	22/01/24	MG	ACE	MG	ACE	APSP	ADD STM WATER OVERLAP		
G	09/01/24	MG	ACE	MG	ACE	APSP	UPGRADE PV TO 200MVA		

REVISION | REFERENCE DRAWINGS

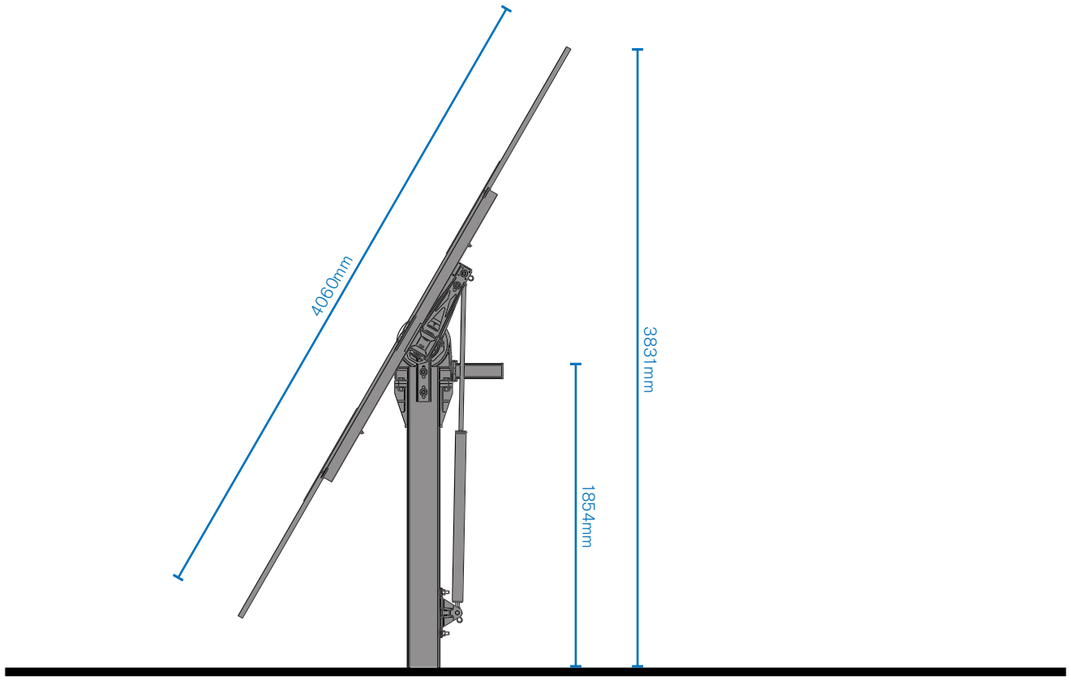
GREEN GOLD ENERGY

Lot 315 BOWER ROAD, AUSTRALIA PLAINS
150 MVA PV EXPORT SYSTEM
SITE PLAN

DATE: 02/09/24	DRN: DS	CHK: ACE	ENG: DS	Q.A: ACE	SCALE: 1:8000
PROJ No APSP	DRG No				REV L

AUTOCAD A1SHEET

EXAMPLE SOLAR ARRAY

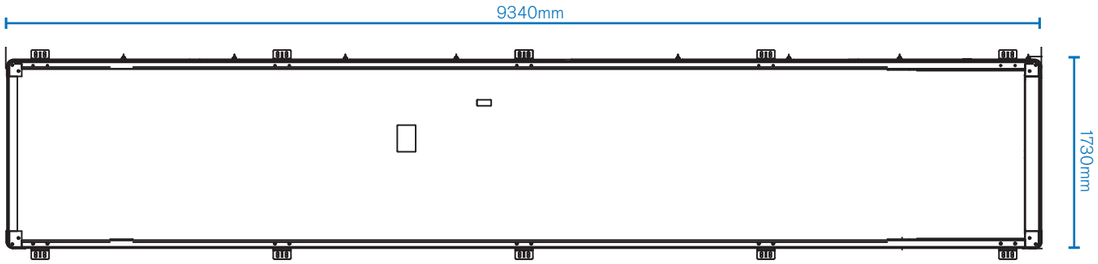


ELEVATION

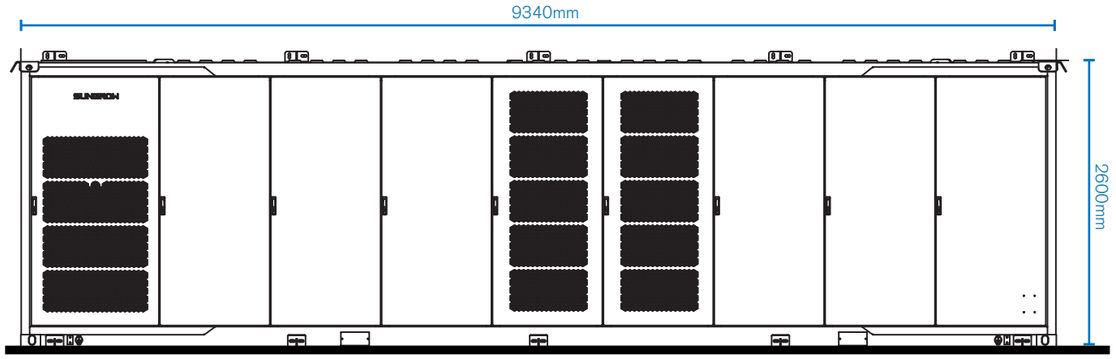
EXAMPLE GROUND-MOUNTED SOLAR ARRAY PROVIDED BY GREEN GOLD ENERGY

EXAMPLE GROUND-MOUNTED SOLAR ARRAY PROVIDED BY GREEN GOLD ENERGY

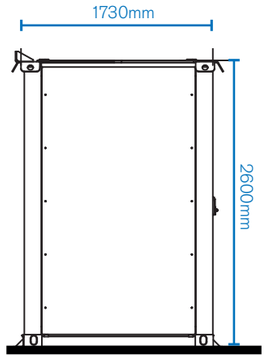
EXAMPLE BATTERY



PLAN 01



ELEVATION 01

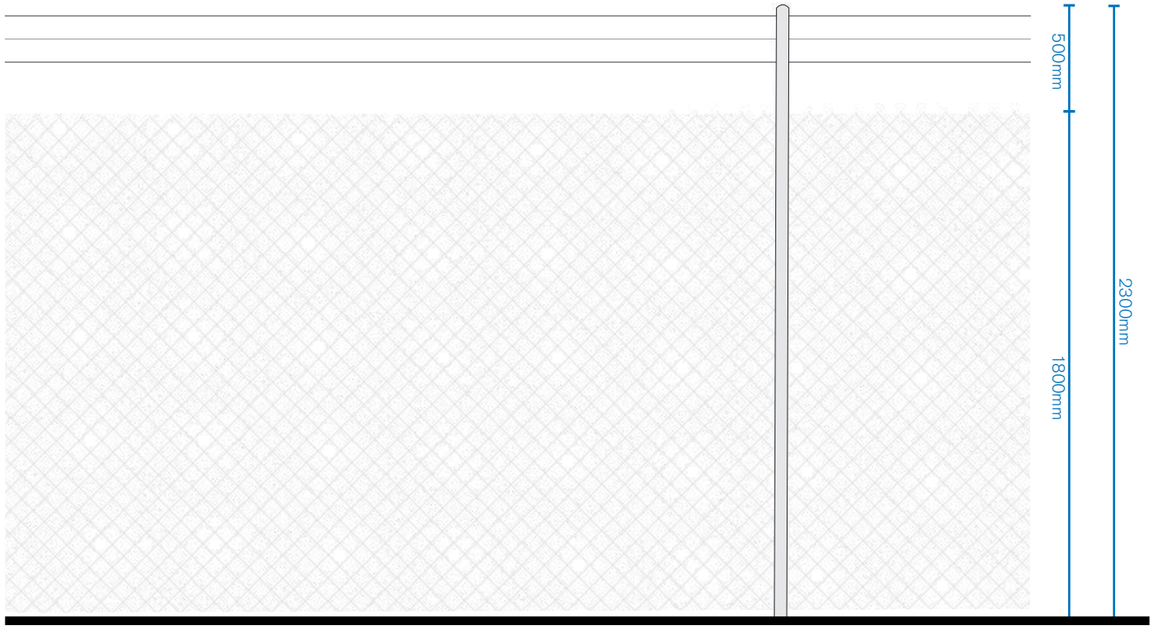


ELEVATION 02

EXAMPLE BATTERY DRAWINGS PROVIDED BY GREEN GOLD ENERGY

EXAMPLE BATTERY, HORNSDALE POWER RESERVE, SA

EXAMPLE SECURITY FENCING

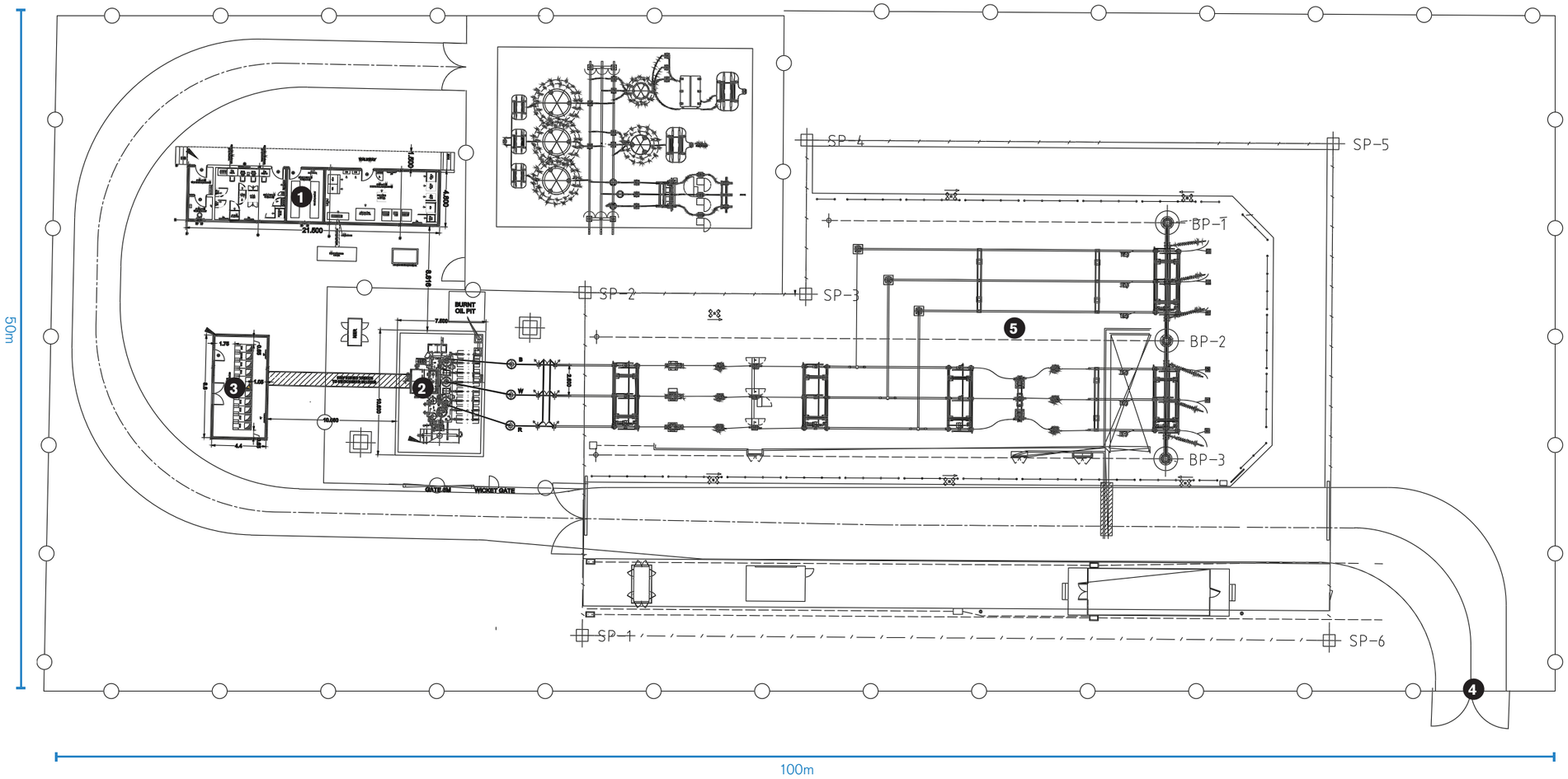


ELEVATION

EXAMPLE SECURITY FENCE AS PER SPECIFICATION PROVIDED BY PLANNING ASPECTS

2.3 METRE HIGH SECURITY FENCE

EXAMPLE SUBSTATION



PLAN

EXAMPLE SUBSTATION PLAN PROVIDED BY GREEN GOLD ENERGY

1	Control room
2	HV E-house
3	Step-up transformer
4	Access
5	Bus pipes

EXAMPLE BUS PIPES, 6-10m IN HEIGHT

Appendix E

SOLAR FARM & BATTERY STORAGE SYSTEM
BOWER ROAD/MICKAN ROAD, AUSTRALIA PLAINS

TRAFFIC IMPACT ASSESSMENT

CIRQA™

DISCLAIMER

DOCUMENT CONTROL

Report title:	Solar Farm & Battery Energy Storage System Lot 315 Bower Road, Australia Plains Traffic Impact Assessment
Project number:	23527
Client:	Green Gold Energy Pty Ltd
Client contact:	Elton Zhang

Version	Date	Details/status	Prepared by	Approved by
V1	19 Dec 23	For submission	BNW	BNW

CIRQA Pty Ltd
ABN 17 606 952 309
PO Box 144, Glenside SA 5065
Level 1, 27 Halifax Street, Adelaide SA 5000
(08) 7078 1801
www.cirqa.com.au

TABLE OF CONTENTS

1. INTRODUCTION

CIRQA has been engaged to review access arrangements and traffic impact considerations associated with the proposed solar farm at Lot 315 Bower Road and 91 Mickan Road, Australia Plains.

The proposed development comprises the construction of a Photovoltaic Energy Generation System with a generation capacity of 200 MW Solar Farm and a 400 MWh Battery Energy Storage System.

This report details the review undertaken of access opportunities for the subject site, identifies the preferred access route and considers traffic impacts during construction and the subsequent operation of the site.

2. BACKGROUND

2.1 SUBJECT SITE

The subject site comprises two allotments, namely Lot 315 Bower Road and 91 Mickan Road Road, Australia Plains. Both allotments are utilised as pastural land with no development/improvements contained within them. The Planning and Development Code identifies that the allotments are both located within a Primary Production Zone. Lot 315 Bower Road is bound by Bower Road, Junction Road to the east, an unnamed public road to the west and agricultural land to the south. 91 Mickaen Road is bound by Mickan Road to the south-east, Bower Road to the north-east and Junction Road to the west.

Figure 1 illustrates the location of the subject site and the surrounding road network.

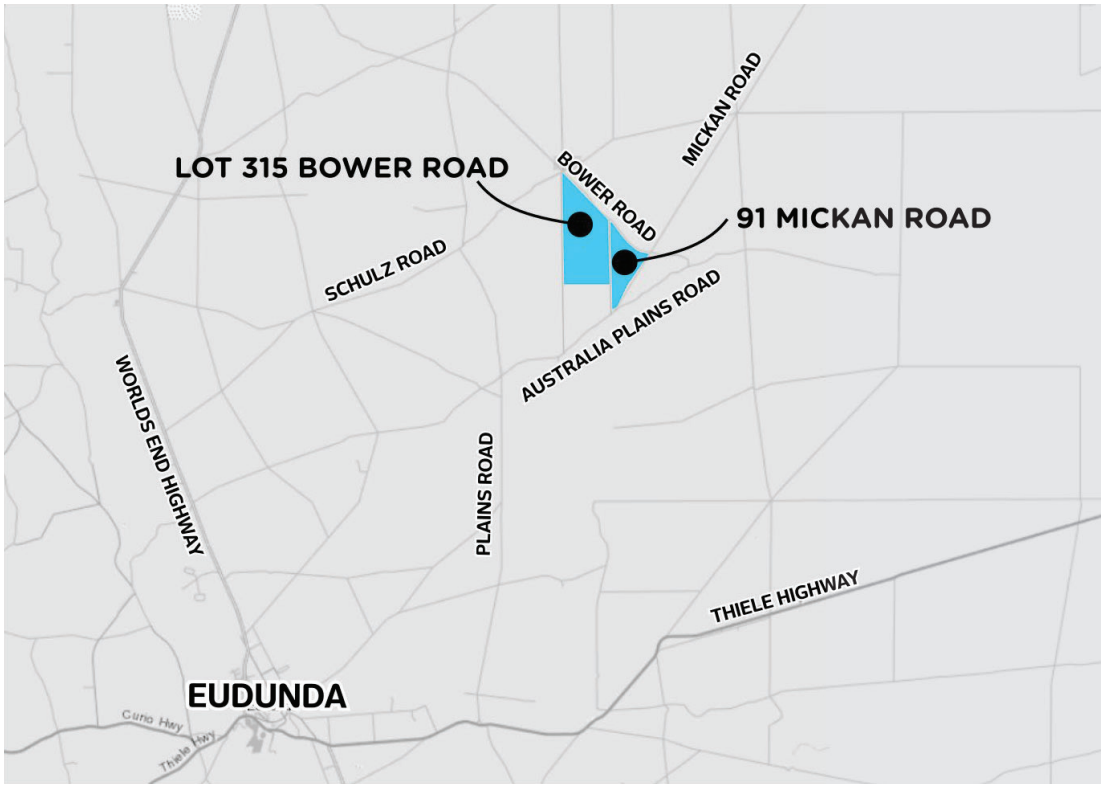


Figure 1 – Location of the subject site and adjacent road network

Access to Lot 315 Bower Road is currently accommodated via an unnamed road reserve along the allotment's western boundary. The reserve connects to Junction Road at its southern end and Bower Road at its northern end. The site also has frontage to Bower Road to the north-east and Junction Road to the east. Bower Road is an unsealed road, where Junction Road is unmade.

Access to 91 Mickan Road is currently accommodated via Emmaus Road (along the site's south-eastern boundary).

2.2 ADJACENT ROAD NETWORK

The surrounding road network primarily comprises a combination of low volume, rural roads and unmade roads. These 'made' roads typically comprise unsealed two-way carriageways with widths in the order of 8 m to 10 m. The roads immediately adjacent the site have the following conditions:

- Bower Road – unsealed rural road with an approximate carriageway width of 8 m;
- Emmaus Road (Australia Plains Road) – unsealed rural road with an approximate carriageway width of 8 m;
- Mickan Road – unsealed rural road with an approximate carriageway width of 8 m;
- Junction Road – unmade road; and
- Unnamed Road (west of the site) – unsealed access track that is poorly formed and would generally be only accessible by 4WD vehicles (in its current condition).

The general rural speed limit of 100 km/h applies on these roads, albeit given the unsealed nature of the roads, lower speeds would generally be experienced.

The unsealed road network provides access to/from the Thiele Highway (approximately 11.5 km south of the site) and the Worlds End Highway (approximately 11.5 km west of the site). Both roads are sealed and typically comprise a single traffic plus a shoulder in each direction separated by a marked centre line. Both Highways are gazetted for use by 26 m B-Doubles and PBS Level 2A vehicles. A 110 km/h speed limit generally applies on both Highways (with reductions in the vicinity of townships along each route).

The Department Infrastructure and Transport (DIT) traffic data indicates traffic volumes are in the order of 390 vehicles per day (vpd) on the Thiele Highway and 550 vpd on the Worlds End Highway.

3. ROUTE ASSESSMENT

3.1 ACCESS OPTION REVIEW

A review of the available access routes for the overall site has been undertaken. This has included detailed inspection of the various routes which could be utilised to achieve access between the site and either the Thiele Highway or Worlds End Highway. Figure 2 illustrates the key routes considered.

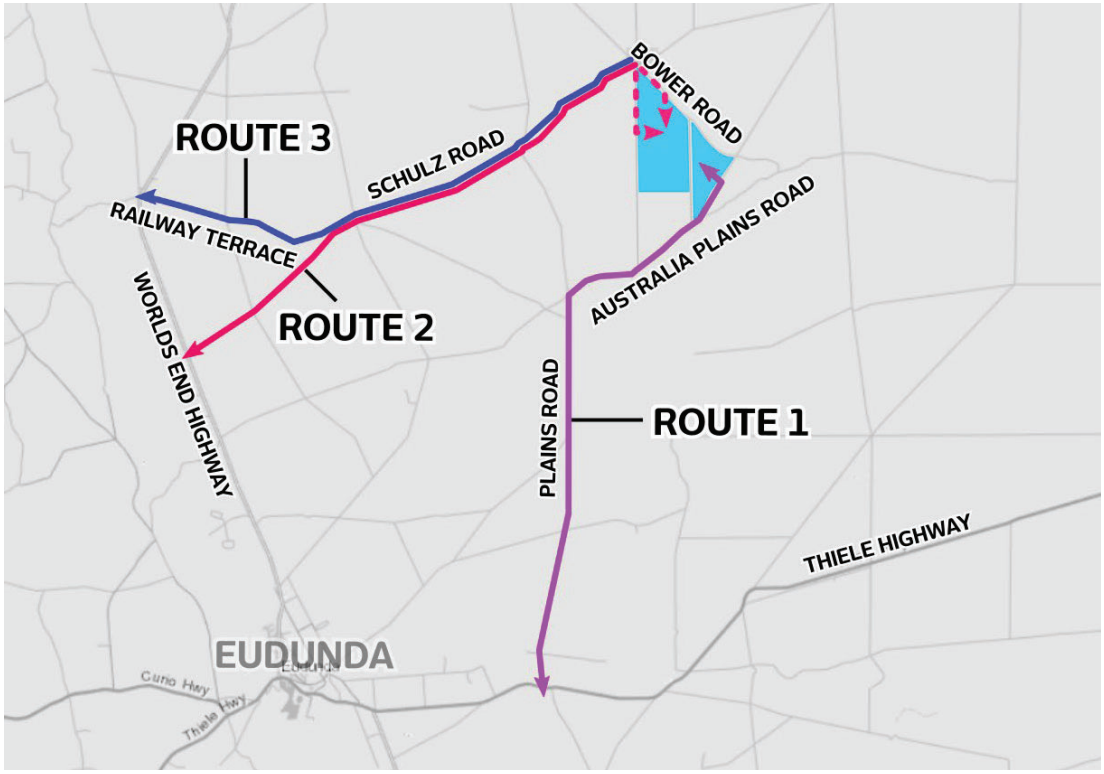


Figure 2 – Key access routes for the allotments

Based on the review of the above routes, the following key constraints and opportunities have been identified:

- **Route 1 – Thiele Highway–Plains Road–Australia Plains Road**
  - There is limited sight distance provision at the intersection of Plains Road and Thiele Highway. Given the curved alignment of Thiele Highway and adjacent topography, the sight distance restrictions would be difficult to address (without significant cost and land acquisition). This would be a particular issue for commercial vehicles exiting Plains Road on to Thiele Highway. The sight distance issue is illustrated in Figure 3 and Figure 4.

Figure 3 - Restricted sight distance to the west along Thiele Highway (from Plains Road)

Figure 4 - Restricted sight distance to the east along Thiele Highway (from Plains Road)

- This route would require vehicles to undertake a right-turn from Plains Road to Australia Plains (Emmaus) Road (and the reverse left-turn when

exiting). The available road reserve widths at this intersection would be insufficient to accommodate the turning movements of large commercial vehicles without road widening and land acquisition (refer Figure 5).

Figure 5 - Restricted corner radius at intersection of Plains Road/Australia Plains (Emmaus) Road

- **Route 2 – Worlds End Highway–Emmaus Road**
  - The intersection of Worlds End Highway and Emmaus Road has more than sufficient Safe Intersection Sight Distance (SISD) and Approach Sight Distance (ASD) (for all approaches) in line with the requirements of the Austroads' "*Guide to Road Design Part 4A: Unsignalised and Signalised Intersections*" (AGRD04A-17) for movements into and out of Schulz Road (refer Figure 5 and Figure 6).

Figure 6 - Adequate sight distance to the north along Worlds End Highway (from Emmaus Road)

Figure 7 - Adequate sight distance to the north along Worlds End Highway (from Emmaus Road)

- The existing layout of the Worlds End Highway/Emmaus Road intersection would also adequately accommodate the turning movements of the required vehicles.
- The eastern end of the access route could connect directly to the subject site (with an appropriately designed and constructed access point).
- This route would generally minimise turning movements long the route from Worlds End Highway (which assists with the accommodation of commercial movements and avoids excessive upgrade requirements).

- **Route 3 – Worlds End Highway–Schulz Road**
  - The intersection of Worlds End Highway and Schulz Road has more than sufficient Safe Intersection Sight Distance (SISD) and Approach Sight Distance (ASD) (for all approaches) in line with the requirements of the Austroads' "*Guide to Road Design Part 4A: Unsignalised and Signalised Intersections*" (AGRD04A-17) for movements into and out of Schulz Road (refer Figure 8 and Figure 9).

Figure 8 - Adequate sight distance to the north along Worlds End Highway (from Schulz Road)

Figure 9 - Adequate sight distance to the north along Worlds End Highway (from Schulz Road)

- The existing layout of the Worlds End Highway/Schulz Road intersection would also adequately accommodate the turning movements of the required vehicles.
- The eastern end of the access route could either connect to the site via Bower Road or the unmade road to the west of the site.
- This route would generally minimise turning movements at the intersection with the exception of movements at Schulz Road/Railway Terrace and turning movements at the eastern end (depending on exact access option adopted). The intersection of Schulz Road/Railway Terrace is angled such that commercial vehicle turns would be adequately accommodated.

- **Route 4 – Worlds End Highway–Railway Terrace–Schulz Road**
  - This route would provide similar conditions to those reported for Route 2, however the intersection of Railway Terrace with Worlds End Highway has restricted sight distances for vehicles exiting Railway Terrace.

Figure 10 - Restricted sight distance to the north along Worlds End Highway (from Railway Terrace)

Figure 11 - Restricted sight distance to the south along Worlds End Highway (from Railway Terrace)

3.2 RECOMMENDED ROUTES

On the basis of the above review, it is considered that either Route 2 or Route 3 are the desirable routes in respect to the safe accommodation of commercial vehicle access for the site. It is recommended that commercial vehicle access for

91 Mickan Road be achieved via a connection through Lot 315 Bower Road (albeit staff/light vehicle access could be undertaken via Emmaus Road). Appropriate traffic control should be implemented where such a connection crosses the unmade portion of Junction Road. Further detail in respect to the two routes is provided below including discussions regarding the typical considerations associated with the operation of large commercial vehicles (including Restricted Access Vehicles) along rural roads as detailed below.

While both options are considered appropriate, Route 2 provides the best direct access to the subject allotments (Route 3 would either require construction of new access on Bower Road or significant upgrade of the unnamed/unmade road to the west of Lot 315 Bower Road). Internal access provisions would be required regardless of the option adopted to enable access between the two allotments. Nevertheless, both options are discussed in further detail below.

3.2.1 ROUTE 2 (EMMAUS ROAD ROUTE)

3.2.1.1 ROAD ALIGNMENT

The recommended road comprises a generally straight alignment, albeit there are some horizontal bends. These are sufficient radii to adequately accommodate the anticipated vehicle movements. The vertical alignment of the access route is generally flat, albeit there are some areas with some minor vertical undulation.

3.2.1.2 CARRIAGEWAY WIDTHS

Route 2 comprises unsealed road carriageways with good road surface condition and adequate carriageway width. Formed widths are generally in the order of 7.0 m to 9.0 m which are considered sufficient to safely accommodate the anticipated commercial vehicle movements.

3.2.1.3 OVERTAKING

Given the low level of existing and future traffic volumes (refer Section 5), the likelihood of overtaking would be very low. There are, however, numerous overtaking opportunities given the extent of straight sections of road with clear approach sight distance.

3.2.1.4 SIGHT DISTANCES

Sight distance provisions along the Route and its intersections are generally good with no significant issues identified. In particular, more than sufficient Safe Intersection Sight Distance is available at the intersection of Worlds End Highway with Emmaus Road (in both directions).

3.2.1.5 INTERSECTIONS

A number of intersections are located along the recommended route. Only one of the intersections (Emmaus Road/Worlds End Highway) will require turning movements for access to/from the site other than the access point for the site itself (the remaining intersections are associated with through-bound movements). Accordingly, swept path assessment has been undertaken for the intersection of Worlds End Highway and Emmaus Road. This has been based on B-Double movements (the largest vehicles anticipated to be utilised for access to the site without police escort – which would be required for over-dimensional and over-mass vehicle access).

Figure 3 illustrates the associated turn paths. The turn paths indicate that such vehicles would be adequately accommodated. It is noted that such movements would not be able to occur simultaneously, however, given the very low number of movements (detailed in Section 4), this would not be required. It is, however, recommended to extend the existing seal of the apron on Emmaus Road approach to the intersection with additional spray sealing (from the existing 10 m to 20 m) to minimise distribution of gravel on to the Highway as a result of increased vehicle movements (if this route is adopted).

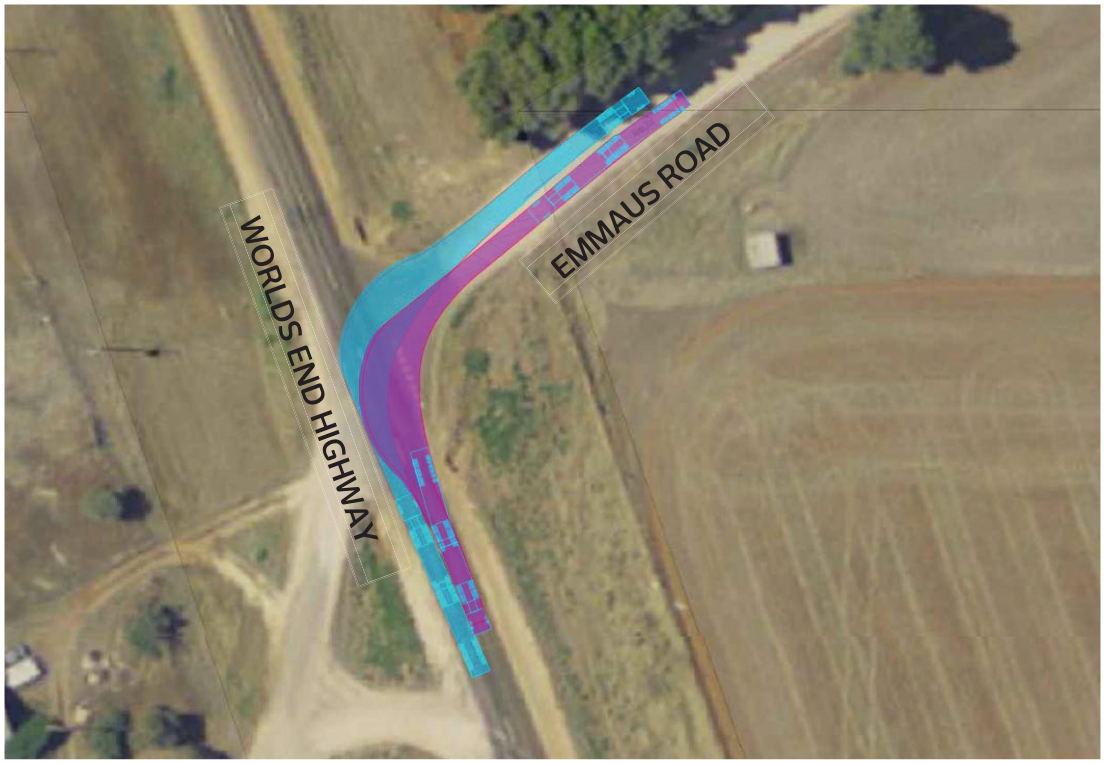


Figure 12 – B-Double turning movements at the Worlds End Highway/Emmaus Road intersection

3.2.1.6 ENTRY LENGTH ONTO THE HIGHWAY

Entry lane lengths (i.e. acceleration lanes) for heavy vehicles entering onto a main road or highway in 80 km/h and 110 km/h zones are typically considered where the use of Restricted Access Vehicles is proposed. These lengths are determined by the distance required for a heavy vehicle to accelerate to 70% of the posted speed limit of the road which vehicles are entering. For a 110 km/h operating speed on the Worlds End Highway, the entry lane length would be significant (1,620 m) and onerous for application to the subject proposal (particularly given the temporary nature of the construction phase).

Consideration is, however, also given to likely traffic volumes and traffic composition. As noted above, there are approximately 600 vpd accommodated on the Worlds End Highway and assuming a 50%/50% split, 300 vpd would be experienced in each direction. The number of commercial vehicle movements associated with the proposed facility (as detailed in Section 5) will be very low. The potential interaction between through-bound vehicles and commercial vehicles entering Worlds End Highway is considered to be very low. Furthermore, the available SISD and ASD is greater than the requirements of the Austroads's guides on both Worlds End Highway approaches and Emmaus Road. This will assist drivers of commercial vehicles exiting Emmaus Road to view oncoming vehicles and select an appropriate gap to enter the traffic stream and also allow a through-bound driver sufficient stopping distance to view and react to an entering vehicle. On the basis of the above, it is considered the existing situation represents a low conflict risk and is acceptable.

3.2.1.7 VERTICAL OVERHEAD CLEARANCES

No specific head height issues (in relation to accommodation of the anticipated vehicles and their associated operating heights) were identified along the recommended route.

3.2.2 ROUTE 3 (SCHULZ ROAD ROUTE)

3.2.2.1 ROAD ALIGNMENT

The recommended road comprises a generally straight alignment, albeit there are some horizontal bends. These are sufficient radii to adequately accommodate the anticipated vehicle movements. The vertical alignment of the access route is generally flat, albeit there are some areas with some minor vertical undulation.

3.2.2.2 CARRIAGEWAY WIDTHS

Route 3 comprises unsealed road carriageways with good road surface condition and adequate carriageway width. Formed widths are generally in the order of 7.0 m to 9.0 m which are considered sufficient to safely accommodate the anticipated commercial vehicle movements.

3.2.2.3 OVERTAKING

Given the low level of existing and future traffic volumes (refer Section 5), the likelihood of overtaking would be very low. There are, however, numerous overtaking opportunities given the extent of straight sections of road with clear approach sight distance.

3.2.2.4 SIGHT DISTANCES

Sight distance provisions along Route 3 and its intersections are generally good with no significant issues identified. In particular, more than sufficient Safe Intersection Sight Distance is available at the intersection of Worlds End Highway with Schulz Road (in both directions).

3.2.2.5 INTERSECTIONS

A number of intersections are located along the recommended route. Three of the intersections will require turning movements for access to/from the site (the remaining intersections are associated with through-bound movements). Accordingly, swept path assessment has been undertaken for the three locations where turning movements will be required. As for Route2, this has been based on B-Double movements.

Turning movements for B-Double vehicles at the intersection of Worlds End Highway and Schulz Road have been assessed as illustrated in Figure 4. The turn paths indicate that such vehicles would be adequately accommodated. However, it would be desirable to spray seal the Schulz Road approach to the intersection (for 20 m) to minimise distribution of gravel on to the Highway as a result of increased vehicle movements.

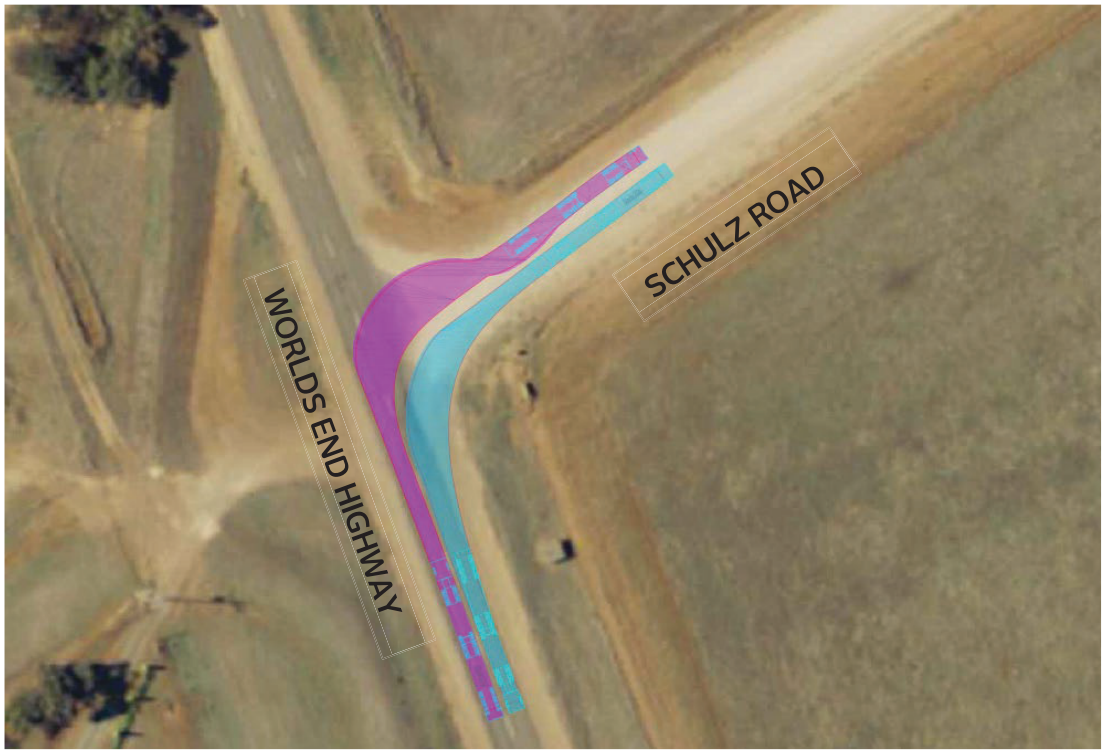


Figure 13 – B-Double turning movements at the Worlds End Highway/Schulz Road intersection

Turning movements at the intersection of Schulz Road/Railway Terrace have also been reviewed for B-Double vehicles as illustrated in Figure 5 (which confirm such movements will be adequately accommodated).

Figure 14 – B-Double turns into and out of the Schulz Road/Railway Terrace intersection

At its eastern end, access to/from the site would generally be preferable via Bower Road (to minimise both construction costs for the unmade road and conflict points at the intersection of Bower Road, Schulz Road, Back Road and the unmade road. Turning movements for B-Double vehicles entering and exiting Bower Road via Schulz Road are provided in Figure 6 and Figure 7. Such vehicles would not be able to access the intersection simultaneously. However, given the very low number of vehicle movements anticipated (refer Section 5) this is considered acceptable.

Figure 15 – B-Double movement from Schulz Road into Bower Road

Figure 16 – B-Double movement from Bower Road into Schulz Road

3.2.2.6 ENTRY LENGTH ONTO THE HIGHWAY

As with Route 2, there is no separate acceleration lane for vehicles exiting Schulz Road to Worlds End Highway. Nevertheless, the available SISD and ASD is greater than the requirements of the Austroads's guides on both Worlds End Highway approaches and Schulz Road. For the same reasons discussed in Section 3.2.1.6 it is considered the existing situation represents a low conflict risk and is acceptable.

3.2.2.7 VERTICAL OVERHEAD CLEARANCES

No specific head height issues (in relation to accommodation of the anticipated vehicles and their associated operating heights) were identified along the recommended route.

4. TRAFFIC IMPACT

4.1 CONSTRUCTION PHASE

The primary generation of traffic associated with the site will occur during the construction phase. This will include a requirement for heavy (commercial) vehicle access to/from the site via the recommended route. It is generally expected that construction vehicles will be B-Double vehicles or smaller. Use of B-Doubles on Schulz Road and Bower Road would require these roads to either be gazetted for such vehicles or permits be issued. An application to the National Heavy Vehicle Regular (NHVR) would be required to progress the gazettal or permit processes. This document can form the 'Route Assessment" report typically provided in support of a proposed Restricted Access Vehicle route application.

Occasional access will also be required by oversized or over-mass vehicles and these could be accommodated via permit and (if required) police escort. Applications to the NHVR would be required when over-dimension or over-mass vehicle access is required.

Based on similar solar farm projects, the following traffic generation rates for commercial vehicle movements over the full construction period have been adopted:

- 1.74 medium rigid truck movements per MW;
- 0.57 heavy rigid truck movements per MW;
- 4.93 truck and dog movements per MW;
- 5.85 Semi-Trailer movements per MW;
- 3 B-Double movements per MW;
- 0.34 Low Loader movements per MW; and
- 0.01 Over-dimension and/or Over-mass vehicle movements per MW.

On this basis, the total number of commercial vehicle movements associated with the construction phase would be as follows (rounded up):

- 348 medium rigid truck movements;
- 114 heavy rigid truck movements;
- 986 truck and dog movements;
- 1,170 Semi-Trailer movements;
- 600 B-Double movements;
- 68 Low Loader movements; and

- 2 Over-dimension and/or Over-mass vehicle movements.

In respect to movements associated with the BESS, standalone BESS projects reviewed by CIRQA have been anticipated to generate in the order of 20 commercial vehicle movements per MWh during the construction phases. For the subject proposal, this would equate to an additional 8,000 commercial vehicle movements through the construction period. In reality, the above generation rate has been identified for smaller BESS facilities and, in reality, it is anticipated that volumes would be lower. Additionally, while specific 'break-down' of the commercial vehicle types has not been identified for the previous BESS projects, it is anticipated that it would be relatively similar to that identified above for the solar farm component.

On the basis of the forecasts above, there could be up to 11,288 commercial vehicles movements in total during the construction period. In reality, given the above generation rates are based on standalone (separate) solar farm and BESS sites, the combined construction arrangement will result in a number of efficiencies. Realistic construction volumes will therefore be lower than suggested by this total forecast. Nevertheless, it has been adopted for conservatism.

Assuming the proposal takes 24 months to construct (with 600 effective work days), there would be an average of 18.8 daily commercial vehicle movements associated with the proposed facility's construction. In reality, the level of construction traffic will vary depending on the project phase, however, it is considered that commercial vehicle volumes would generally be less than 15 movements per day.

In addition to commercial vehicles, assuming all construction staff are accommodated off-site, it is assumed that in the order of an additional 30 light vehicle movements would be experienced per day.

The above level of movements is very low. There would be in the order of 5 movements per hour or less. Such volumes would be well below any warrants for upgrade requirements along the subject roads and intersections other than works associated with the proposed access point and internal connections within the site (taking into account the requirements of the relevant Austroads' guides). However, as noted in Section 4, it is considered desirable to spray seal the approach of either Schulz Road or Emmaus Road (depending on the access route adopted) to Worlds End Highway (for 20 m) to minimise gravel spread on to the Highway (given the increased vehicle movements associated with the proposal). The recommend route options (Route 2 or 3) are considered to have appropriate road conditions to accommodate such volumes.

4.2 OPERATIONAL PHASE

Once operational, the level of traffic generation associated with the site will be even lower. Movements would generally by associated with routine inspections and maintenance. These movements would occur infrequently and would be well within the capacity of the surrounding road network.

5. SUMMARY

It is proposed to construct a 200 MW capacity Photovoltaic Energy Generation System (Solar Farm) and 400 MWh at Lot 315 Bower Road and 91 Mickan Road, Australia Plains.

A review of options for access routes to accommodate vehicle movements associated with the site has been undertaken. Based on opportunities and constraints identified during detailed site inspections, it has been recommended that vehicles accessing the site do so vie either:

- between Worlds End Highway and Emmaus Road; and/or
- Worlds End Highway, Schulz Road and Bower Road (or alternatively the unnamed/unmade road immediately west of the site subject to appropriate upgrade).

In addition, internal access provisions between the two sites is desirable (i.e. 91 Mickan Road be accessed via Lot 315 Bower Road).

A review of the likely traffic generation associated with the proposal has been undertaken. The peak generation of traffic will be associated with the construction of the facility which will include both commercial vehicle movements and light/domestic vehicle (car) movements.

Typical volumes generated by the construction of the site will be relatively low (less than 15 movements per day) and well within the capacity of the adjacent road network. It has been recommended that the approach of Emmaus Road and/or Schulz Road (depending on route adopted) to Worlds End Highway be spray sealed for 20 m to minimise gravel spread on to the Highway. No other road network upgrades are considered required to accommodate the forecast movements on the recommended route. Application to the NHVR will be required for the use of restricted access vehicles (such as B-Doubles) and over-dimensional/over-mass vehicles. However, it is considered that such vehicles can be appropriately accommodated on both of the recommended routes.

Golder Associates Pty Ltd

Australia Plains Solar Farm

STORMWATER MANAGEMENT STRATEGY

WGA200068

WGA200068-RP-CV-0002_C

26 March 2024

Revision History

REV	DATE	ISSUE	ORIGINATOR	CHECKER	APPROVER
A	08/05/2020	For Client Review	XT	MOF	JLS
B	12/12/2023	For Approval	XT	MOF	MOF
C	26/03/2024	For Approval	XT	MOF	MOF

CONTENTS

Figures

Tables

Appendices

1 INTRODUCTION

Wallbridge Gilbert Aztec (WGA) was engaged by Golder Associates to prepare a stormwater management strategy and surface water assessment for the proposed solar farm near Australian Plains, South Australia. The development site consists of two allotments spread across approximately 352 hectares in area. The site is located approximately 120km north east of Adelaide and is bordered by Bower Road to the North, Junction Road also separates the two allotments and it has Mickan Road to the East. A locality plan can be seen below in Figure 1.

The purpose of this stormwater management strategy is to determine stormwater catchments for the solar facility and prepare a stormwater management strategy for the site.

Figure 1: Locality Plan

2 CATCHMENT OVERVIEW

2.1 Existing Site Conditions

The site is presently vacant land with no major infrastructure within the site boundaries. Figure 2 below depicts the typical site conditions in the area consisting of land sparsely covered with shrubs and areas with abundant native vegetation. There is also a 275 kV double circuit electrical transmission line that traverses the site in the south western corner.

Figure 2: Typical Existing Site Conditions

The site is approximately 342 hectares in area. The best available topographic map consisted of 10m contours, as shown in the plan included within Appendix A. It should be noted that the general topographic data is not detailed enough to identify any local site undulations. The contours do indicate the general grade of the site from southwest to northeast at an approximate grade of 2-5%.

SA Topographic Maps indicate there are several water flow paths within the site including a main drainage channel along the northern boundary (shown in Figure 3). Observations and drone aerial photography from a site visit conducted on 12 March 2020 confirms the channel shown in Figure 3. The existing channel appears to be eroded, which indicates in rainfall events the channel can receive significant flows at high velocities. There is a sizable upstream catchment contributing flows to the development site, the catchment area is approximately 380ha. The Topographic Maps also indicated the site area is subject to inundation as identified on the plan in Appendix A. It is recommended that the solar panels be located at least 10m from existing water courses to reduce the risk of localised scour around the panel footings. The local Council may also stipulate that development be located outside of flood and riparian zones.

Figure 3: Existing Drainage Channel along the Northern Boundary.

2.2 Proposed Development and Design Requirements

The solar panels are designated to occupy 235ha of the site, the switchyard is to occupy approximately 5.6ha and the Battery Energy Storage System (BESS) is to occupy approximately 4ha. The proposed site layout plan can be seen in Appendix A.

The proposed solar panel surfaces that prevent direct rainfall to the ground surface is estimated to occupy approximately 50% of the 235ha solar panel construction area. It is recommended ground surface below the solar panels and land between solar panels will remain as existing.

There are two access points to the development, one on Bower Road and the other from Mickan Road.

Figure 4: Typical Ground-Mounted Solar Panel Layout

A typical ground-mounted solar panel is shown in Figure 4. A series of angled panels form a continuous impervious area and does not impede natural surface flow paths. Other impervious areas include the switchyard, 5.6ha and the BESS, 4ha. No further impervious areas are proposed for the site, and it is advised to maintain the existing conditions under the solar panels and within the open spaces between rows of panels.

In lieu of applicable stormwater management standards for this type of development, WGA has recommended reasonable design standards to develop stormwater management measures. These are summarised below:

- Protect the site from upstream runoff
- Control excess runoff to ensure it does not impact downstream properties and assets
- Manage stormwater discharge from the site to allow it to be dispersed overland
- Manage runoff within the site to ensure that erosion is minimised

3 CATCHMENT HYDROLOGY

3.1 Stormwater Management Approach

A recent engineering study[1] concluded that the addition of solar panels over a grassy field has very little effect on the volume of runoff, peak discharge nor time to peak. Therefore, the study concluded that the minor increase in runoff may not necessarily require formalised stormwater management intervention. This is assuming ground cover under the panels is maintained and/or reinstated to its natural condition. This stormwater management strategy considers the development elements which may affect runoff, as such it adopts a retention-based approach to constrain runoff within the site to pre-development levels.

The stormwater management approach is based on keeping existing grades and flow paths. Four main catchments have been identified, to prevent post development flows directly flowing to the existing main channel each catchment is proposed to have interception swales. Swale 1, 2 and 3 have been proposed parallel to existing major channels and swale 4 is proposed along the southern boundary intercepting any flows entering the allotment south of the development. These swales will direct site flows to proposed retention basins and any overflow from the basins will flow into adjacent existing channels.

It is recommended that no solar arrays be installed within a 10m buffer zone of any water flow path and the main creek's floodplain. The intention of the retention basins is to provide temporary storage and to prevent any concentrated runoff flowing downstream, minimising the potential for downstream erosion and nuisance. Refer Appendix C for stormwater management plan layout.

3.2 Existing Catchment

The kinematic wave equation was used to determine the pre-development time of concentration for each of the four catchment areas. The rational method was then used to determine the pre-development site stormwater discharge for the 1% AEP storm event. A pre-development runoff of 0.3 has been adopted. The runoff results are summarised in Table 1, and the spreadsheet calculations have been included as Appendix D.

Table 1: Pre-Development Runoff Summary 1% AEP

CATCHMENT	AREA (ha)	TIME OF CONCENTRATION (min)	RUNOFF FLOW (m^3/s)
1 and 2 combined	272.6	45	15.5
3	45.1	50	2.2
4	25.8	44	1.5

3.3 Post Development Stormwater Strategy

As outlined above, the site surface itself will remain unchanged from existing conditions; however, it is possible that the solar panels may somewhat alter the surface runoff characteristics. To be conservative this analysis will assume the solar panels do alter the surface runoff characteristics.

The solar panels are completely impervious and act to concentrate any rainfall onto the localised area just below the lip of the panel. The runoff will fall from the panels onto the existing ground in areas between the rows and then disperse under the panels joining flow paths that are currently present at the site. It is proposed to maintain and use existing flow paths in conjunction with swales along the eastern and southern boundaries to intercept and direct flow to the proposed retention basins.

[1] Hydrologic Response of Solar Farms, Lauren M. Cook, S.M.ASCE; and Richard H. McCuen, M.ASCE (2011)

Rational Method – Basin Sizing

For the post-development scenario, the runoff coefficient for the areas with solar panels adopts a value of 0.4 for the runoff coefficient while the hardstand area uses a value of 0.9. The undisturbed areas will remain as a coefficient of 0.3. Subsequently, a weighted runoff coefficient for each catchment area was calculated and is displayed in Table 2.

The time of concentration for each catchment was calculated using a combination of the kinematic wave equation and the Bransby Williams equation, the runoff from the 1% AEP storm event was then calculated using the rational method. To restrict the post-development stormwater outflow to match the pre-development conditions, the required retention volumes were calculated. Refer to Table 2 for summarised results and Appendix D for detailed calculations.

Table 2: Rational Method Post Development Results Summary

CATCHMENT	AREA (ha)	WEIGHTED COEFFICIENT	TIME OF CONCENTRATION (min)	RUNOFF FLOW (m^3/s)	RETENTION BASIN VOLUME (m^3)
1 and 2 combined	272.6	0.43	45	18.5	5500
3	45.1	0.45	51	2.8	1800
4	25.8	0.73	37	3.2	3800

The calculations are included in Appendix D and the stormwater management strategy is provided in Appendix C. The strategy plan indicatively depicts the approximate location and size of the proposed retention storage areas.

3.4 Swale Sizing

The manning's equation was used to indicatively size swales. The minimum swale sizes for each catchment can be seen in Table 3 below. The calculations are included in Appendix D and the stormwater management strategy is provided in Appendix C.

Table 3: Swale Sizing

CATCHMENT	1% AEP FLOW (m^3/s)	SWALE DEPTH (m)	SWALE BATTERS	SWALE BASE WIDTH (m)
1	16.5	0.6	1:3	12
2	2	0.2	1:3	3
3	2.8	0.35	1:3	3
4	3.2	0.4	1:3	3

4 SUMMARY

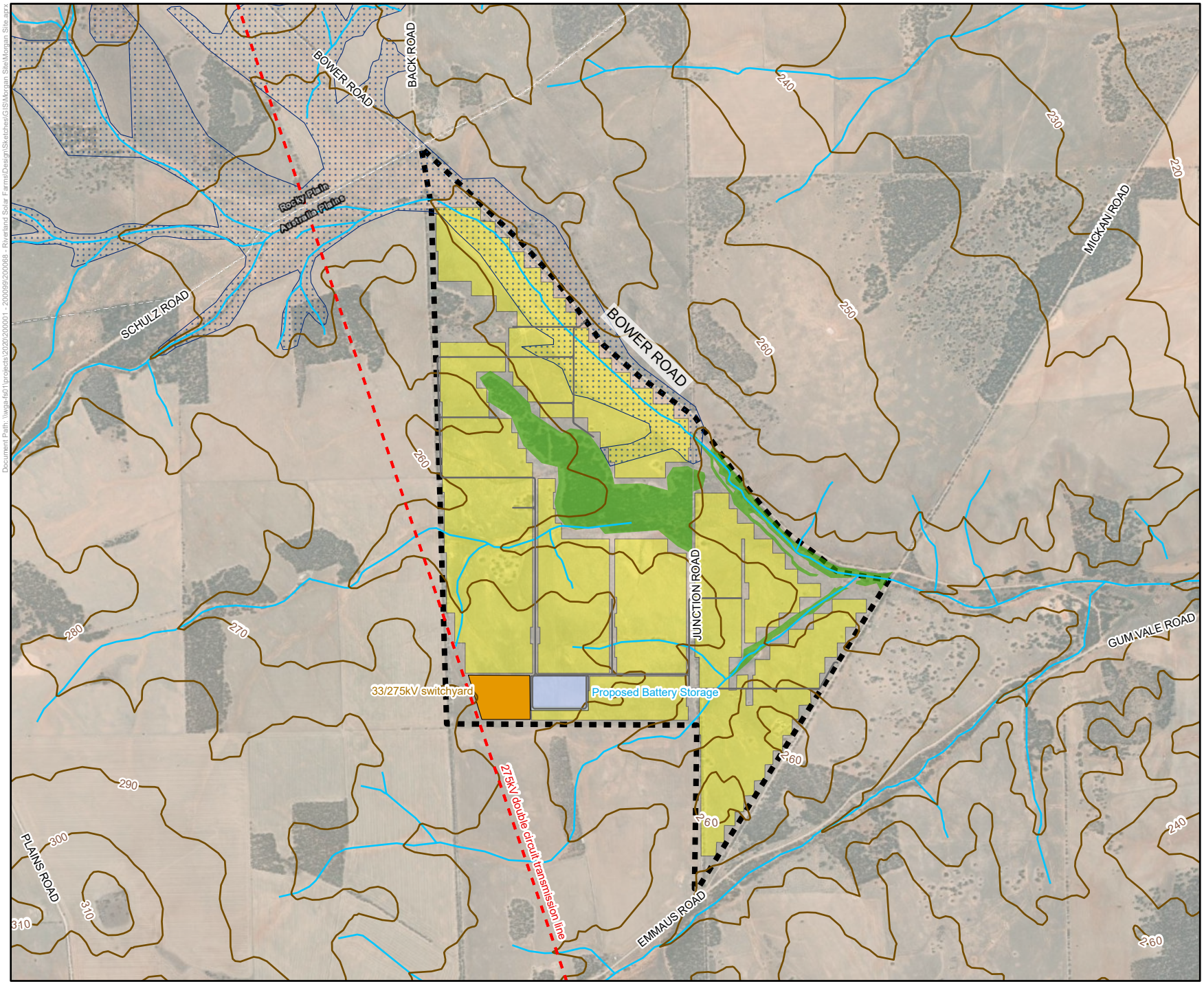
4.1 Stormwater Management Approach

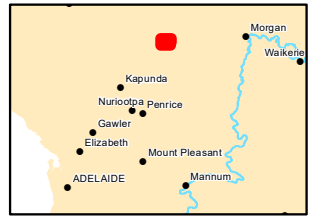
The purpose of this stormwater management strategy is to determine stormwater catchments for the proposed Australia Plains Solar Farm Site and to prepare a suitable stormwater management strategy for the site. This report provides an outline of the stormwater approach only, and further detailed design works will be required.

The key points addressed within the strategy are:

- There are several water flow paths within the site including the main drainage channel along the northern boundary. This channel also has an inundation zone within the development site, it is recommended that no solar arrays be mounted within the inundation zone or within the 10m buffer around it. This zone will accommodate a drainage swale to capture runoff from the site and direct it into a retention basin.
- There are four distinct catchment areas each will have its own swale which leads flows to a retention basin in the low point of the catchment. The management plan is shown in Appendix C.
- The approximate retention storage volumes have been listed in Table 2 with a proposed total development site basin volume of 11,100m3.

APPENDIX A
LOCALITY PLAN





LEGEND

- Site Road
- 275kV double circuit transmission line
- Contour (10m)
- Watercourse
- Reserved Area For Vegetation
- Subject to Inundation
- Solar Cells
- 33/275kV Switchyard
- Proposed Battery Storage
- Approximate Site Boundary

N

0 200 400 600 800 m

Scale 1:25,000 @ A4

Coordinate System: GDA 1994 MGA Zone 54

WGA

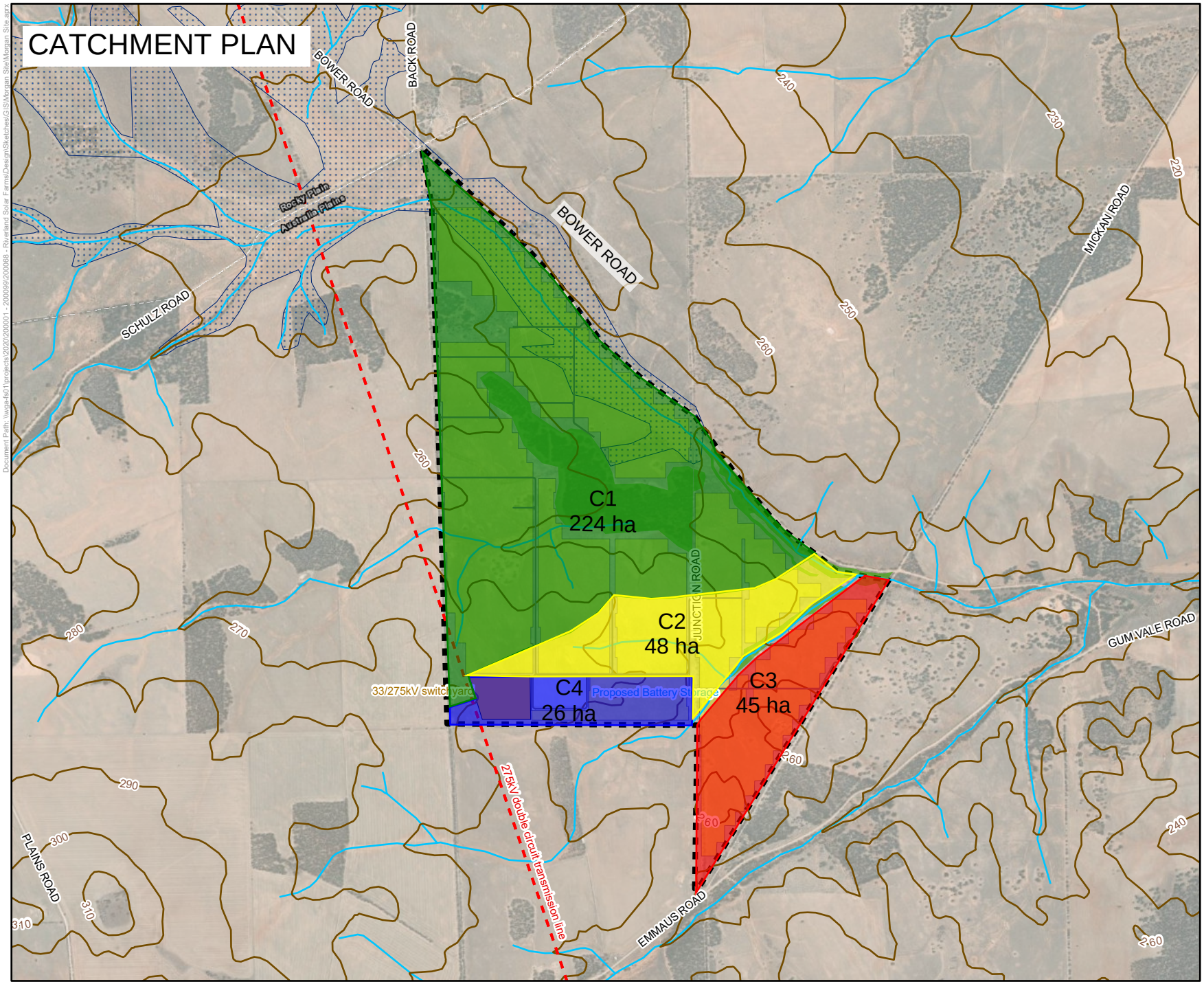
Figure **1**

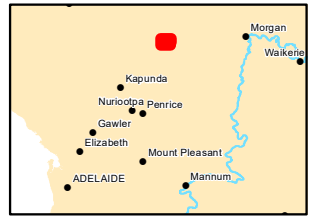
Riverland Solar Farms

Australia Plains Site

APPENDIX B
CATCHMENT PLAN

CATCHMENT PLAN





LEGEND

- Site Road
- 275kV double circuit transmission line
- Contour (10m)
- Watercourse
- Reserved Area For Vegetation
- Subject to Inundation
- Solar Cells
- 33/275kV Switchyard
- Proposed Battery Storage
- Approximate Site Boundary

N

0 200 400 600 800 m

Scale 1:25,000 @ A4

Coordinate System: GDA 1994 MGA Zone 54

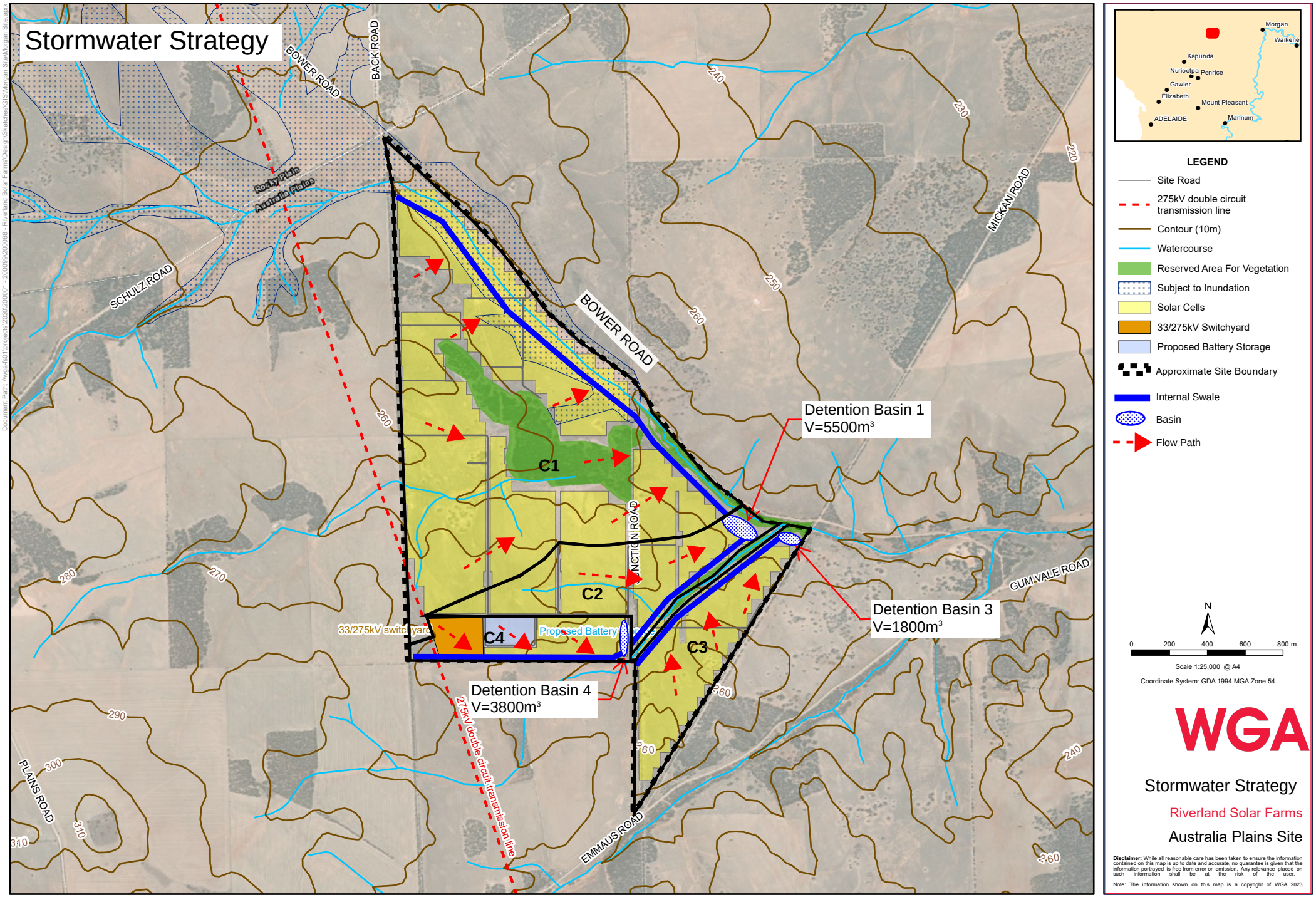
WGA

Catchment Plan

Riverland Solar Farms

Australia Plains Site

APPENDIX C
STORMWATER MANAGEMENT STRATEGY


Stormwater Strategy
BOWER ROAD
BACK ROAD
SCHULZ ROAD
BOWER ROAD
MICKAN ROAD
JUNCTION ROAD
GUM VALE ROAD
EMMAUS ROAD
PLAINS ROAD
Rocky Plain
Australia Plains
C1
C2
C3
C4
33/275kV switchyard
Proposed Battery
Detention Basin 1
V=5500m³
Detention Basin 3
V=1800m³
Detention Basin 4
V=3800m³
275kV double circuit transmission line
240
230
220
250
260
270
280
290
300
310
Morgan
Waikerie
Kapunda
Nuriootpa
Penrice
Gawler
Elizabeth
Mount Pleasant
ADELAIDE
Mannum
LEGEND
Site Road
275kV double circuit transmission line
Contour (10m)
Watercourse
Reserved Area For Vegetation
Subject to Inundation
Solar Cells
33/275kV Switchyard
Proposed Battery Storage
Approximate Site Boundary
Internal Swale
Basin
Flow Path
N
0
200
400
600
800 m
Scale 1:25,000 @ A4
Coordinate System: GDA 1994 MGA Zone 54
WGA
Stormwater Strategy
Riverland Solar Farms
Australia Plains Site
Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Any relevance placed on such information shall be at the risk of the user.
Note: The information shown on this map is a copyright of WGA 2023

APPENDIX D
CALCULATIONS

Rational Method

Catchment 1 and 2

Pre-Development

Region	Runoff Coefficient	Area	C x A	C weighted average		C	I	I	Q	Q
		m2	*m2*				*mm/hr*	*m/s*	*m3/s*	*l/s*
Catchment 1	0.3	2,242,000	672,600	0.822	**1 in 100**	0.36	57.0	1.58E-05	**15.5**	**15,531.01**
Catchment 2	0.3	484,500	145,350	0.178						
		2,726,500	**817,950**	**0.300**	**fraction impervious**	-				

Time of Concentration - Kinematic Wave

L	1470	*m*
n	0.012	short grass
S	0.0136	*m/m*

1 in 100		
I	**79.48**	*mm/hr*
tc	**24.5**	*mins*
	0.0	

tc	24.5	mins
1 in 100	**79.5**	mm/hr

Bransby Williams

L	0.535	km
A	2.23	km2
Se	5.61	m/km

1 in 100		
tc	20.3	mins
tc (total)	**44.8**	mins
I	**57.0**	mm/hr

Post-Development

Region	Runoff Coefficient	Area	C x A	C weighted average		C	I	I	Q	Q
		m2	*m2*				*mm/hr*	*m/s*	*m3/s*	*l/s*
Undeveloped	0.3	1,154,800	346,440	0.424	**1 in 100**	0.43	57.0	1.58E-05	**18.5**	**18,515.31**
Solar Panels	0.4	1,571,700	628,680	0.576						
Hardstand	0.9	-	-	0.000						
		2,726,500	**975,120**	**0.358**	**fraction impervious**	-				

Time of Concentration - Kinematic Wave

L	1470	*m*
n	0.012	short grass
S	0.0136	*m/m*

1 in 100		
I	**79.48**	*mm/hr*
tc	**24.5**	*mins*
	0.0	

tc	24.5	mins
1 in 100	**79.5**	mm/hr

Bransby Williams

L	0.535	km
A	2.23	km2
Se	5.61	m/km

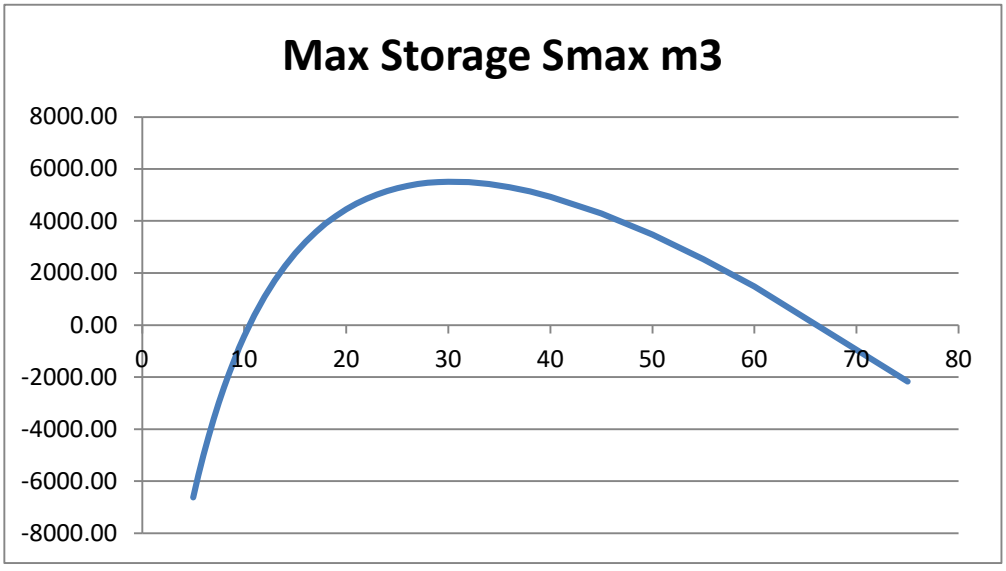
1 in 100		
tc	20.3	mins
tct	**44.8**	mins
I	**57.0**	mm/hr

Detention Assessment

Area	2,726,500	m^2
Coeff Permeability	0.43	
Time of conc.	44.79	*min*
ARI Storm	100	*year*
Max Outflow (Pre)	15,531	*l/sec*
1 in 100 year pre development peak flow		
Max Storage Required	5506	*m3*

Duration	Intensity ARI event	Inflow rate	Inflow Vol Vi	Max Storage
min	*mm/hr*	*l/sec*	*m3*	*Smax m3*
5	170.06	55277.2	16583.17	-6613.66
5.5	164.57	53492.1	17652.38	-5777.41
6	159.47	51835.5	18660.77	-5001.99
6.5	154.73	50292.1	19613.90	-4281.82
7	150.29	48849.4	20516.73	-3611.96
7.5	146.13	47497.0	21373.67	-2987.99
8	142.22	46226.3	22188.60	-2406.02
8.5	138.54	45029.4	22965.02	-1862.57
9	135.06	43900.0	23706.00	-1354.55
9.5	131.78	42832.2	24414.33	-879.18
10	128.66	41820.8	25092.48	-434.00
11	122.91	39949.9	26366.93	374.52
12	117.70	38256.5	27544.67	1086.33
13	112.96	36715.7	28638.27	1714.00
14	108.62	35307.3	29658.13	2267.93
15	104.65	34014.4	30612.94	2756.81
16	100.98	32822.9	31510.01	3187.95
17	97.59	31721.1	32355.56	3567.57
18	94.45	30699.0	33154.90	3900.98
19	91.52	29747.9	33912.61	4192.76
20	88.79	28860.5	34632.65	4446.87
21	86.24	28030.5	35318.48	4666.77
22	83.84	27252.4	35973.11	4855.46
23	81.59	26521.2	36599.19	5015.62
24	79.48	25832.7	37199.10	5149.59
25	77.48	25183.3	37774.89	5259.46
26	75.59	24569.5	38328.44	5347.08
27	73.80	23988.5	38861.41	5414.12
28	72.11	23437.7	39375.29	5462.06
29	70.50	22914.6	39871.41	5492.26
30	68.97	22417.2	40351.00	5505.91
32	66.12	21492.1	41264.84	5487.90
34	63.53	20649.2	42124.46	5415.66
36	61.16	19877.9	42936.22	5295.56
38	58.97	19169.1	43705.47	5132.94
40	56.96	18515.3	44436.73	4932.35
45	52.56	17082.5	46122.80	4288.77
50	48.86	15880.5	47641.61	3477.92
55	45.71	14856.6	49026.77	2533.43
60	42.99	13973.0	50302.91	1479.92
75	36.67	11920.4	53641.91	-2170.03
90	32.17	10456.2	56463.70	-6337.19
105	28.78	9354.8	58935.02	-10854.83
120	26.13	8493.4	61152.23	-15626.57

135	24.00	7799.5	63175.85	-20591.90
150	22.24	7227.4	65046.29	-25710.42
165	20.76	6746.7	66791.88	-30953.78
180	19.49	6336.4	68433.28	-36301.33
195	18.40	5981.7	69986.05	-41737.52
210	17.45	5671.6	71462.17	-47250.34
225	16.61	5397.9	72871.16	-52830.31
240	15.86	5154.2	74220.64	-58469.78
270	14.58	4738.6	76765.09	-69903.23
300	13.53	4396.3	79134.24	-81511.99
360	11.89	3863.5	83451.35	-105150.69
420	10.66	3465.2	87324.12	-129233.73
480	9.70	3154.4	90847.12	-153666.54
540	8.93	2903.8	94084.24	-178385.23
600	8.30	2696.7	97081.28	-203344.00
660	7.76	2522.0	99872.52	-228508.57
720	7.30	2372.3	102484.56	-253852.34
840	6.55	2128.0	107251.71	-304996.81
960	5.96	1935.9	111510.30	-356649.84
1080	5.48	1780.1	115349.98	-408721.79
1200	5.08	1650.5	118836.93	-461146.45
1320	4.74	1540.7	122021.87	-513873.13
1440	4.45	1446.1	124944.75	-566861.88
1800	3.77	1226.3	132435.61	-727105.87
2160	3.29	1068.2	138444.97	-888831.37
2520	2.92	948.1	143353.35	-1051657.86
2880	2.62	853.1	147413.35	-1215332.72
3240	2.39	775.7	150802.27	-1379678.66
3600	2.19	711.3	153649.68	-1544566.11
3960	2.02	656.8	156053.22	-1709897.43
4320	1.88	609.9	158088.28	-1875597.24



Rational Method

Catchment 3

Pre-Development

Region	Runoff Coefficient	Area	C x A	C weighted average		C	I	I	Q	Q
		m2	*m2*				*mm/hr*	*m/s*	*m3/s*	*l/s*
Catchment 3	0.3	451,000	135,300	1.000	**1 in 100**	0.36	48.9	1.36E-05	**2.2**	**2,203.46**
		451,000	**135,300**	**0.300**	**fraction impervious**	-				

Time of Concentration - Kinematic Wave

L	780	*m*
n	0.012	short grass
S	0.0154	*m/m*

1 in 100		
I	108.62	*mm/hr*
tc	**14.2**	*mins*
	0.0	

tc	14.2	mins
1 in 100	**108.6**	mm/hr

Bransby Williams

L	1	km
A	0.448	km2
Se	15.00	m/km

1 in 100		
tc	36.6	mins
tc (total)	**50.8**	mins
I	**48.9**	mm/hr

Post-Development

Region	Runoff Coefficient	Area	C x A	C weighted average
		m2	*m2*	
Undeveloped	0.3	94,400	28,320	0.209
Solar Panels	0.4	356,600	142,640	0.791
Hardstand	0.9	-	-	0.000
		451,000	**170,960**	**0.379**

	C	I	I	Q	Q
		mm/hr	*m/s*	*m3/s*	*l/s*
1 in 100	0.45	48.9	1.36E-05	**2.8**	**2,784.21**

fraction impervious -

Time of Concentration - Kinematic Wave

L	780	*m*
n	0.012	short grass
S	0.0154	*m/m*

1 in 100		
I	108.62	*mm/hr*
tc	**14.2**	*mins*
	0.0	
tc	14.2	mins
1 in 100	**108.6**	mm/hr

Bransby Williams

L	1	km
A	0.448	km2
Se	15.00	m/km

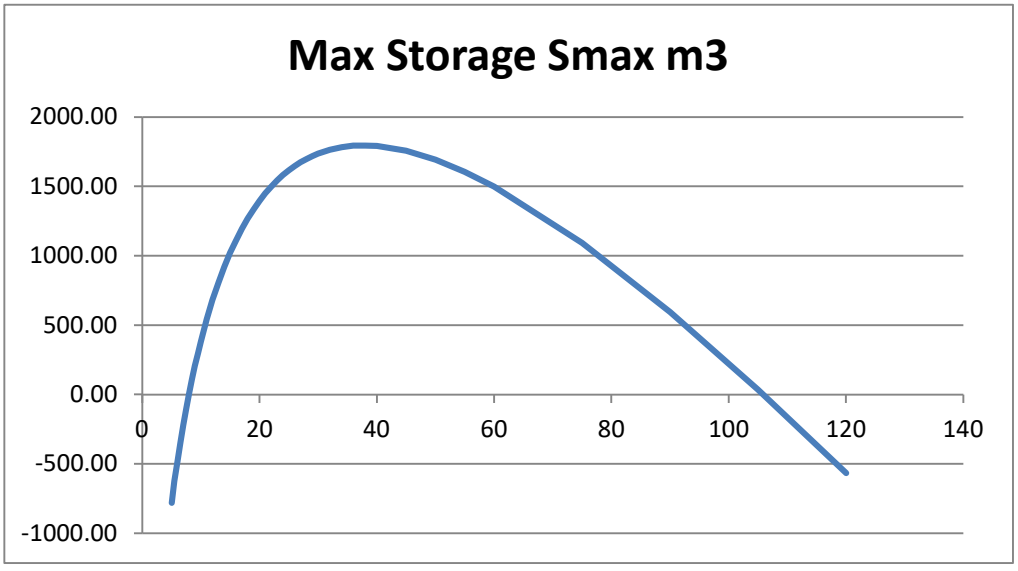
1 in 100		
tc	36.6	mins
tc (total)	**50.8**	mins
I	**48.9**	mm/hr

Detention Assessment

Area	451,000	m^2
Coeff Permeability	0.45	
Time of conc.	50.77	*min*
ARI Storm	100	*year*
Max Outflow (Pre)	2,203.46	*l/sec*
1 in 100 year pre development peak flow		
Max Storage Required	1795	*m3*

Duration	Intensity ARI event	Inflow rate	Inflow Vol Vi	Max Storage
min	*mm/hr*	*l/sec*	*m3*	*Smax m3*
5	170.06	9691.3	2907.40	-778.97
5.5	164.57	9378.3	3094.85	-624.57
6	159.47	9087.9	3271.64	-480.83
6.5	154.73	8817.3	3438.75	-346.77
7	150.29	8564.4	3597.04	-221.54
7.5	146.13	8327.3	3747.27	-104.35
8	142.22	8104.5	3890.15	5.47
8.5	138.54	7894.7	4026.27	108.54
9	135.06	7696.6	4156.18	205.40
9.5	131.78	7509.4	4280.37	296.54
10	128.66	7332.1	4399.26	382.38
11	122.91	7004.1	4622.70	539.71
12	117.70	6707.2	4829.19	680.09
13	112.96	6437.1	5020.92	805.72
14	108.62	6190.1	5199.72	918.42
15	104.65	5963.5	5367.12	1019.72
16	100.98	5754.6	5524.40	1110.89
17	97.59	5561.4	5672.64	1193.03
18	94.45	5382.2	5812.78	1267.07
19	91.52	5215.5	5945.63	1333.81
20	88.79	5059.9	6071.87	1393.94
21	86.24	4914.4	6192.11	1448.08
22	83.84	4777.9	6306.88	1496.75
23	81.59	4649.7	6416.64	1540.41
24	79.48	4529.0	6521.82	1579.48
25	77.48	4415.2	6622.77	1614.33
26	75.59	4307.6	6719.82	1645.27
27	73.80	4205.7	6813.26	1672.61
28	72.11	4109.1	6903.35	1696.60
29	70.50	4017.4	6990.34	1717.48
30	68.97	3930.2	7074.42	1735.46
32	66.12	3768.0	7234.63	1763.47
34	63.53	3620.3	7385.35	1781.97
36	61.16	3485.0	7527.66	1792.08
38	58.97	3360.8	7662.53	1794.74
40	56.96	3246.1	7790.74	1790.74
45	52.56	2994.9	8086.34	1755.83
50	48.86	2784.2	8352.62	1691.59
55	45.71	2604.7	8595.47	1603.92
60	42.99	2449.8	8819.21	1497.13
75	36.67	2089.9	9404.61	1090.98
90	32.17	1833.2	9899.33	594.14
105	28.78	1640.1	10332.61	35.86
120	26.13	1489.1	10721.33	-566.97

135	24.00	1367.4	11076.12	-1203.74
150	22.24	1267.1	11404.05	-1867.37
165	20.76	1182.8	11710.09	-2552.88
180	19.49	1110.9	11997.86	-3256.66
195	18.40	1048.7	12270.09	-3975.99
210	17.45	994.4	12528.89	-4708.74
225	16.61	946.4	12775.92	-5453.28
240	15.86	903.6	13012.51	-6208.24
270	14.58	830.8	13458.61	-7745.25
300	13.53	770.8	13873.97	-9313.00
360	11.89	677.4	14630.86	-12522.34
420	10.66	607.5	15309.84	-15809.59
480	9.70	553.0	15927.50	-19158.15
540	8.93	509.1	16495.04	-22556.84
600	8.30	472.8	17020.48	-25997.62
660	7.76	442.2	17509.85	-29474.48
720	7.30	415.9	17967.80	-32982.75
840	6.55	373.1	18803.59	-40079.42
960	5.96	339.4	19550.21	-47265.24
1080	5.48	312.1	20223.39	-54524.51
1200	5.08	289.4	20834.73	-61845.62
1320	4.74	270.1	21393.12	-69219.69
1440	4.45	253.5	21905.56	-76639.69
1800	3.77	215.0	23218.88	-99123.73
2160	3.29	187.3	24272.45	-121867.51
2520	2.92	166.2	25133.00	-144804.31
2880	2.62	149.6	25844.80	-167889.86
3240	2.39	136.0	26438.96	-191093.06
3600	2.19	124.7	26938.17	-214391.19
3960	2.02	115.1	27359.57	-237767.15
4320	1.88	106.9	27716.35	-261207.72



Rational Method

Pre-Development

Region	Runoff Coefficient	Area	C x A	C weighted average		C	I	I	Q	Q
		m2	*m2*				*mm/hr*	*m/s*	*m3/s*	*l/s*
Catchment	0.3	258,100	77,430	1.000	**1 in 100**	0.36	57.0	1.58E-05	**1.5**	**1,470.22**
		258,100	**77,430**	**0.300**	**fraction impervious**	-				

Bransby Williams

L	1.2	km
A	0.2727	km2
Se	19.17	m/km

1 in 100		
tc	43.9	mins
tc (total)	**43.9**	mins
I	**57.0**	mm/hr

Post-Development

Region	Runoff Coefficient	Area	C x A	C weighted average
		m2	*m2*	
Undeveloped	0.3	43,645	13,094	0.169
Solar Panels	0.4	118,380	47,352	0.459
Hardstand	1	96,075	96,075	0.372
		258,100	**156,521**	**0.606**

	C	I	I	Q	Q
		mm/hr	*m/s*	*m3/s*	*l/s*
1 in 100	0.73	61.2	1.7E-05	**3.2**	**3,190.68**
fraction impervious	-				

Time of Concentration - Kinematic Wave

L	400	*m*
n	0.012	short grass
S	0.0200	*m/m*

1 in 100		
I	**146.13**	*mm/hr*
tc	**7.8**	*mins*
	0.0	

tc	7.8	mins
1 in 100	**146.1**	mm/hr

Bransby Williams

L	0.8	km
A	0.273	km2
Se	18.75	m/km

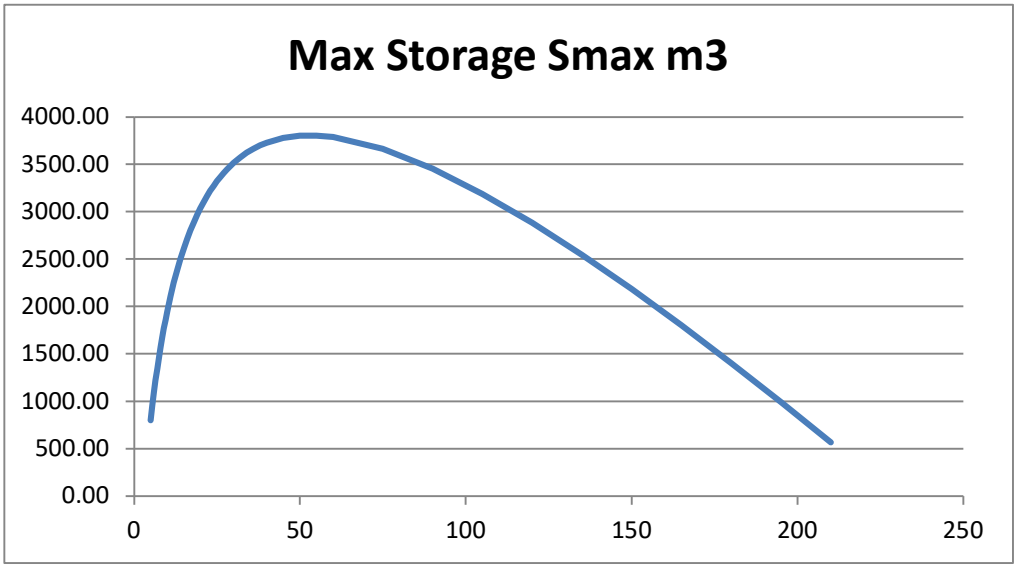
1 in 100		
tc	29.4	mins
tc (total)	**37.2**	mins
I	**61.2**	mm/hr

Detention Assessment

Area	258,100	m^2
Coeff Permeability	0.73	
Time of conc.	37.20	*min*
ARI Storm	100	*year*
Max Outflow (Pre)	1,470.22	*l/sec*
1 in 100 year pre development peak flow		
Max Storage Required	3803	*m3*

Duration	Intensity ARI event	Inflow rate	Inflow Vol Vi	Max Storage
min	*mm/hr*	*l/sec*	*m3*	*Smax m3*
5	170.06	8872.8	2661.83	800.53
5.5	164.57	8586.2	2833.46	950.10
6	159.47	8320.3	2995.32	1089.91
6.5	154.73	8072.6	3148.31	1220.84
7	150.29	7841.0	3293.22	1343.71
7.5	146.13	7623.9	3430.77	1459.21
8	142.22	7420.0	3561.58	1567.96
8.5	138.54	7227.9	3686.21	1670.53
9	135.06	7046.6	3805.15	1767.42
9.5	131.78	6875.2	3918.84	1859.06
10	128.66	6712.8	4027.70	1945.86
11	122.91	6412.5	4232.26	2106.32
12	117.70	6140.7	4421.31	2251.26
13	112.96	5893.4	4596.85	2382.69
14	108.62	5667.3	4760.55	2502.29
15	104.65	5459.8	4913.81	2611.44
16	100.98	5268.5	5057.80	2711.33
17	97.59	5091.7	5193.52	2802.94
18	94.45	4927.6	5321.83	2887.14
19	91.52	4775.0	5443.45	2964.66
20	88.79	4632.5	5559.03	3036.13
21	86.24	4499.3	5669.11	3102.11
22	83.84	4374.4	5774.19	3163.08
23	81.59	4257.0	5874.69	3219.46
24	79.48	4146.5	5970.98	3271.65
25	77.48	4042.3	6063.40	3319.97
26	75.59	3943.8	6152.26	3364.71
27	73.80	3850.5	6237.80	3406.16
28	72.11	3762.1	6320.29	3444.53
29	70.50	3678.1	6399.92	3480.06
30	68.97	3598.3	6476.90	3512.94
32	66.12	3449.8	6623.59	3571.41
34	63.53	3314.5	6761.57	3621.18
36	61.16	3190.7	6891.87	3663.26
38	58.97	3076.9	7015.34	3698.52
40	56.96	2972.0	7132.72	3727.69
45	52.56	2742.0	7403.36	3777.79
50	48.86	2549.0	7647.15	3801.05
55	45.71	2384.7	7869.49	3802.86
60	42.99	2242.9	8074.33	3787.16
75	36.67	1913.4	8610.28	3661.52
90	32.17	1678.4	9063.22	3452.86
105	28.78	1501.6	9459.90	3187.94
120	26.13	1363.3	9815.80	2882.24

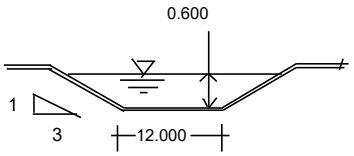
135	24.00	1251.9	10140.61	2545.46
150	22.24	1160.1	10440.85	2184.09
165	20.76	1082.9	10721.04	1802.68
180	19.49	1017.1	10984.51	1404.55
195	18.40	960.1	11233.75	992.19
210	17.45	910.4	11470.69	567.53
225	16.61	866.4	11696.85	132.10
240	15.86	827.3	11913.46	-312.89
270	14.58	760.6	12321.88	-1227.67
300	13.53	705.7	12702.16	-2170.58
360	11.89	620.1	13395.12	-4124.02
420	10.66	556.2	14016.75	-6148.78
480	9.70	506.3	14582.24	-8229.68
540	8.93	466.1	15101.85	-10356.47
600	8.30	432.9	15582.91	-12521.80
660	7.76	404.8	16030.95	-14720.16
720	7.30	380.8	16450.22	-16947.29
840	6.55	341.6	17215.41	-21474.88
960	5.96	310.7	17898.97	-26084.11
1080	5.48	285.7	18515.30	-30760.57
1200	5.08	264.9	19075.00	-35493.66
1320	4.74	247.3	19586.23	-40275.22
1440	4.45	232.1	20055.39	-45098.85
1800	3.77	196.8	21257.78	-59774.82
2160	3.29	171.5	22222.37	-74688.60
2520	2.92	152.2	23010.23	-89779.11
2880	2.62	136.9	23661.92	-105005.79
3240	2.39	124.5	24205.89	-120340.18
3600	2.19	114.2	24662.94	-135761.50
3960	2.02	105.4	25048.74	-151254.07
4320	1.88	97.9	25375.40	-166805.78



Swale 1

Mannings Formula for Trapezoidal Channels

n	0.025	
Channel Slope, S	0.0060	
Depth, y (m)	0.600	
Slope of side, 1:	3.000	
Base Width (m)	12.000	
Area (m2)	8.280	
Wetted Perimeter	15.795	
Flow, Q	**16.680**	**m3/s**
Velocity,V	**2.014**	**m/s ***



Unfinished Concrete : n = 0.014
Earth or Rubble : n = 0.025
Earth with stone or weeds: n = 0.035

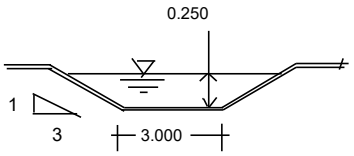
* Maximum Recommended Velocities

Coarse Gravel	1.3 - 1.8	m/s
Grass Covered Surfaces	1.8	
Stiff Sandy Clay	1.3 - 1.5	

Swale 2

Mannings Formula for Trapezoidal Channels

n	0.025	
Channel Slope, S	0.0330	
Depth, y (m)	0.250	
Slope of side, 1:	3.000	
Base Width (m)	3.000	
Area (m2)	0.938	
Wetted Perimeter	4.581	
Flow, Q	**2.366**	**m3/s**
Velocity,V	**2.524**	**m/s ***



Unfinished Concrete : n = 0.014
Earth or Rubble : n = 0.025
Earth with stone or weeds: n = 0.035

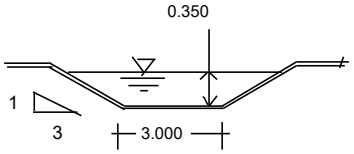
* Maximum Recommended Velocities

Coarse Gravel	1.3 - 1.8	m/s
Grass Covered Surfaces	1.8	
Stiff Sandy Clay	1.3 - 1.5	

Swale 3

Mannings Formula for Trapezoidal Channels

n	0.025	
Channel Slope, S	0.0200	
Depth, y (m)	0.350	
Slope of side, 1:	3.000	
Base Width (m)	3.000	
Area (m2)	1.418	
Wetted Perimeter	5.214	
Flow, Q	**3.366**	**m3/s**
Velocity,V	**2.374**	**m/s ***



Unfinished Concrete : n = 0.014
Earth or Rubble : n = 0.025
Earth with stone or weeds: n = 0.035

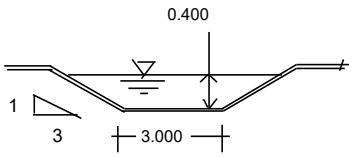
* Maximum Recommended Velocities

Coarse Gravel	1.3 - 1.8	m/s
Grass Covered Surfaces	1.8	
Stiff Sandy Clay	1.3 - 1.5	

Swale 4

Mannings Formula for Trapezoidal Channels

n	0.025	
Channel Slope, S	0.0150	
Depth, y (m)	0.400	
Slope of side, 1:	3.000	
Base Width (m)	3.000	
Area (m2)	1.680	
Wetted Perimeter	5.530	
Flow, Q	**3.720**	**m3/s**
Velocity,V	**2.214**	**m/s ***



Unfinished Concrete : n = 0.014
Earth or Rubble : n = 0.025
Earth with stone or weeds: n = 0.035

* Maximum Recommended Velocities

Coarse Gravel	1.3 - 1.8	m/s
Grass Covered Surfaces	1.8	
Stiff Sandy Clay	1.3 - 1.5	

FOR FURTHER INFORMATION CONTACT:

Xuan Tran
Civil Engineer

T 08 8223 7433
E xtran@wga.com.au

WGA.COM.AU
WGANZ.CO.NZ

Appendix G

2024

IHC

Independent Heritage Consultants

Australia Plains Solar Farm and BESS

Desktop Heritage Assessment

Place	**Australia Plains**
Report Description	Desktop Heritage Assessment
Issue Date	January 2024
Author(s)	IHC Pty Ltd
Version	*Draft*
Associates	N/A
Client	Green and Gold Energy, Pty Ltd
Disclaimer	This report expresses the professional opinion of the authors based on the information cited and presented in this report.
Copyright	
Limitation	This report has been prepared on behalf of and for the exclusive use of IHC's client and is subject to and issued in connection with the provisions of the agreement between IHC and its client. IHC accepts no liability or responsibility whatsoever for or in any respect of any use of or reliance upon this report by any third party.
Citation	IHC 2024. Australia Plains Solar Farm and BESS Desktop Heritage Assessment. Report prepared for Green and Gold Energy, Adelaide, South Australia

Abbreviations

Term	Meaning
AHA	*Aboriginal Heritage Act 1988*
AGD-AAR	Attorney General's Department – Aboriginal Affairs and Reconciliation
ATSIHPA	*Aboriginal and Torres Strait Islander Heritage Protection Act* 1984
EPBCA	*Environment Protection and Biodiversity Conservation Act 1999*
IHC	Independent Heritage Consultants
NTA	*Native Title Act 1993 (Cmwlth)*
PDIA	*Planning, Development and Infrastructure Act* 2016
RARB	Recognised Aboriginal Representative Body

EXECUTIVE SUMMARY

Independent Heritage Consultants (IHC) has been engaged by Green and Gold Energy Pty Ltd to undertake an Aboriginal and historic heritage desktop assessment as part of the planning studies for a proposed new Solar Farm and Battery Energy Storage System proposed on land off Mickan and Bower Road, Australia Plains, South Australia (Map 1).

This heritage assessment contains the results of relevant heritage register searches. It contains a review of relevant Aboriginal and historic background information, alongside an environmental landform analysis, aimed at developing an understanding of the heritage context for the project area. A heritage risk assessment is derived from consideration of the heritage context alongside the proposed work. Heritage management recommendations and impact minimisation opportunities for the planned development are put forward in light of the relevant legislation. This assessment is based on the information currently available.

Historic Heritage

The historic heritage assessment has identified that the planned works will not impact any listed heritage places.

IHC believe there is a **low risk** of works encountering the remains of undocumented historic heritage and archaeological features of significance.

Legal Obligations

All historic heritage and archaeological features, whether listed or not, are protected and must be managed in line with the requirements of the *Heritage Places Act 1994 (HPA)* and the *Planning, Development and Infrastructure Act 2016 (PDIA)*.

- IHC has assessed there is a low risk of works encountering the remains of undocumented built heritage and archaeological features of heritage significance. If any heritage items are found, work should be stopped and the finds immediately reported to Heritage SA.

Common Heritage Management Options

Although not mandated by heritage legislation, the following options can be used to manage unexpected archaeological discoveries for the project.

- The client may choose to implement a site discovery procedure during the works to account for unexpected historic heritage items and the requirements of the HPA in regards to reporting these items. This should be explained to all workers during site inductions.
- As part of this site discovery management process, the client may wish to engage archaeologists to be on call for the identification of any unexpected finds.

Aboriginal Heritage

The heritage assessment indicates that there are no known Aboriginal heritage sites within the project area.

Considering the Aboriginal heritage context for the project area, the environmental landforms and the level of previous development, IHC has determined that there is a **low** risk of works encountering unknown Aboriginal sites and objects.

Although the anthropological risk is low, the groups may still have interests in the area and appreciate consultation on broader issues which fall under community engagement. Further consultation is at the discretion of the client.

Legal Obligations

- All Aboriginal heritage sites are protected under the *Aboriginal Heritage Act 1988* (AHA), whether reported/registered or undocumented. Therefore, if a previously unknown Aboriginal heritage site is discovered during works and cannot be avoided, Ministerial authorisation under section 23 of the AHA will be required.

Common Heritage Management Options

Although not mandated by the AHA, the following options can be used to mitigate heritage risk for the project;

- Implement a site discovery procedure.
- Heritage site induction
- Archaeologist on call to identify potential discoveries.

Native Title

The eastern half of the project area is within the native title claim area of the First Peoples of the Murray Mallee #2. A search of the SA Native Title Vision Web Map indicates while a claim has been accepted by the Federal Court, a determination has not yet been made.

The western half of the project area is within the native title claim area of the Ngadjuri People #2. A search of the SA Native Title Vision Web Map indicates that the Federal Court has made a determination and determined that native title does not exist within the current project area.

There are no current registered Indigenous Land Use Agreements for the area.

Table of Contents

List of Tables

List of Maps

1 INTRODUCTION

Independent Heritage Consultants (IHC) has been engaged by Green and Gold Energy Pty Ltd to undertake an Aboriginal and historic heritage desktop assessment as part of the planning studies for a proposed new Solar Farm and Battery Energy Storage System proposed on land off Mickan and Bower Road, Australia Plains, South Australia (Map 1).

This heritage assessment contains the results of relevant heritage register searches. It contains a review of relevant Aboriginal and historic background information, alongside an environmental landform analysis, aimed at developing an understanding of the heritage context for the project area. A heritage risk assessment is derived from consideration of the heritage context alongside the proposed work. Heritage management recommendations and impact minimisation opportunities for the planned development are put forward in light of the relevant legislation. This assessment is based on the information currently available.

1.1 Report Objectives

The specific objectives of this desktop assessment are as follows;

- Review relevant heritage register searches (AGD AAR Taa Wika and State Heritage Register)
- Review previous relevant heritage assessment reports and background information to establish the heritage context for the study area.
- Prepare a qualitative risk analysis to evaluate the level of risk of encountering Aboriginal and historic heritage sites, such as archaeological and/or anthropological sites, objects or remains.
- Identify and recommend mitigation measures appropriate for the assessed heritage risk.
- Determine native title classification for each study area and whether further advice is required.

Map 1. Project area

2 PROJECT

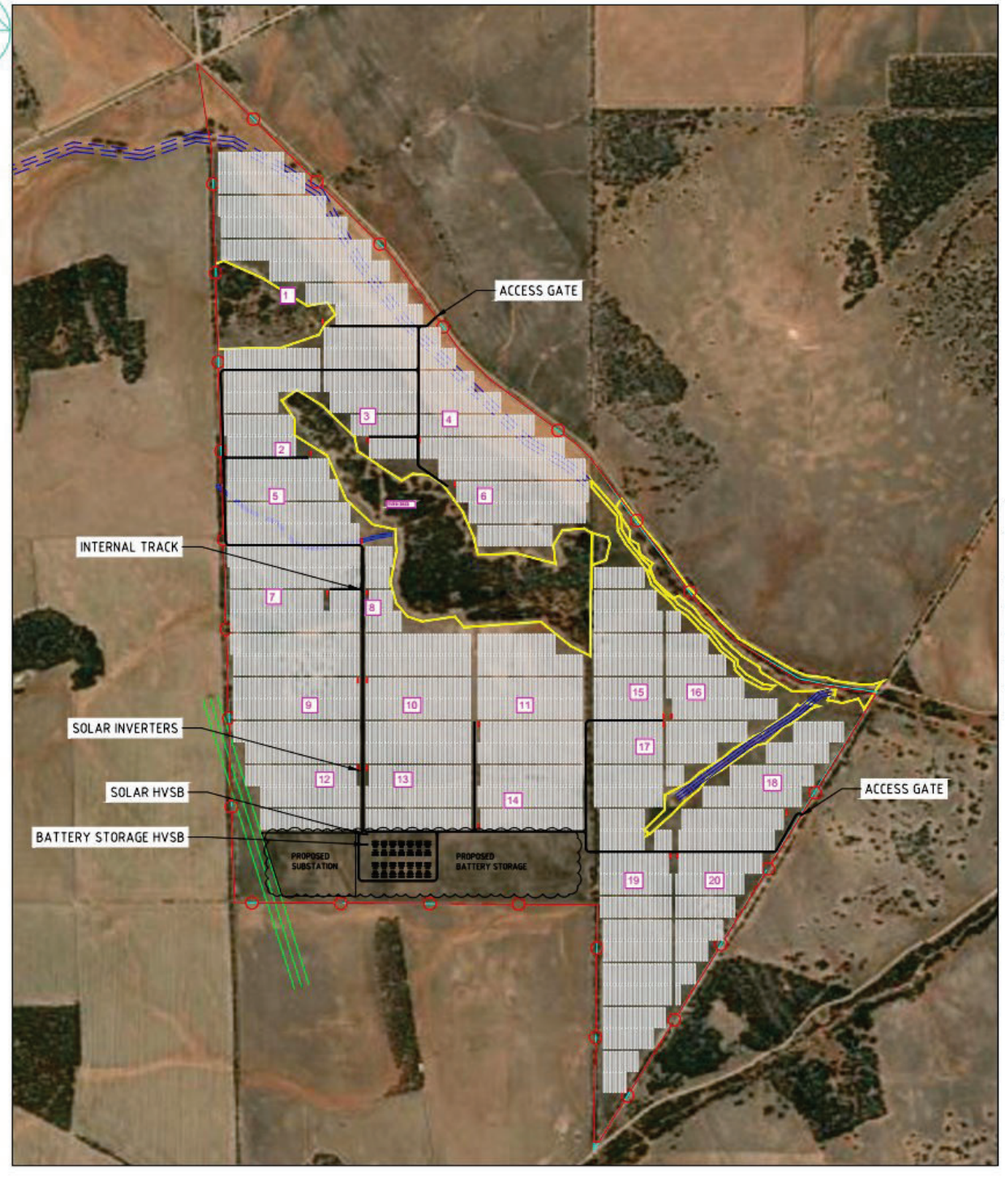
The following project description is derived from preliminary information provided by Green and Gold Pty ltd

2.1 Project Overview

The site is located approximately 11 km northeast of Eudunda, in Australia Plains, South Australia (Map 1). The current preliminary design will consist of photo-voltaic solar arrays and a Battery Energy Storage System (BESS).

Planned project infrastructure will include (See Map 2);

- Solar arrays
- Ancillary structures
- Site access points and access tracks
- Fencing, lighting and CCTV
- Battery Energy Storage System



NOTES

1. ACTUAL DIMENSIONS AND CLEARANCES MAY VARY SUBJECT TO SITE CONDITIONS.
2. DIMENSIONS OF ELECTRICAL EQUIPMENT ARE INDICATIVE ONLY. ACTUAL DIMENSIONS TO BE CONFIRMED.
3. EXISTING SAPN POLE IS FOR ILLUSTRATION ONLY. ACTUAL POSITION IS SUBJECT TO THE ACTUAL MEASUREMENT ON SITE.
4. TWO NEW POLES WILL BE INSTALLED TO CARRY OVERHEAD TRANSMISSION LINES AND CONNECT TO ESSENTIAL ENERGY NETWORK.
5. SITE STORAGE AND AMENITY FACILITIES TO BE ON SITE ONLY DURING CONSTRUCTION PHASE. NO PERMANENT BUILDINGS TO BE KEPT ON SITE AFTER CONSTRUCTION COMPLETED.

LEGEND

- PROPOSED PV ARRAY
- SECURITY FENCE
- PROPERTY BOUNDARY
- RESERVED AREA FOR VEGETATION
- POTENTIAL WATER PATHS
- ELECTRANET EASEMENT

HV CABLE 2D STATISTICS (ROUND UP TO 10M)

String ID	First Inverter	Length (m)	Second Inverter	Length (m)	Third Inverter	Length (m)	Fourth Inverter	Length (m)	End	CABLE LENGTH (m)
A	1	480	2	700	7	750	12	300	HVSB	2230
B	4	200	3	380	5	520	9	600	HVSB	1700
C	6	550	8	350	10	350	13	350	HVSB	1600
D	16	100	17	50	15	650	11	750	HVSB	1550
E	18	500	20	80	19	750	14	420	HVSB	1750

TYPICAL BATTERY & INVERTER UNIT

112-MODULE 2 PORTRAIT TRACKER

SYSTEM SPECIFICATIONS

DC	200.07	MW	TOTAL MODULES	351008
MODULE CAPACITY	570	W	MODULES PER STRING	28
NUMBER OF SOLAR INVERTERS	20	-	NUMBER OF STRINGS	12536
SOLAR INVERTER MODEL	INGECON-7400-FSK-C	-	MODULE MODEL	LR5-72HTH-570M
BATTERY INVERTER MODEL	INGECON-7320-FSK-C		NUMBER OF BATTERY INVERTERS	28
BATTERY CAPACITY	400	MWh	BATTERY MODEL	TBD

FOR INFORMATION

No	DATE	DRN	CHK	ENG	Q.A.	PROJECT	DESCRIPTION	NUMBER	TITLE
F	09/11/23	DS	ACE	DS	ACE	APSP	UPDATE DC CAPACITY		
E	26/10/23	DS	ACE	DS	ACE	APSP	UPDATE COORDINATE		
D	18/09/23	MG	ACE	MG	ACE	APSP	HV CABLE ROUTE & 2P TRACKER		
C	09/05/23	MG	ACE	MG	ACE	APSP	UPGRADE MODULE		
B	22/03/23	MG	ACE	MG	ACE	APSP	CHANGE TRACKER PITCH		
A	22/03/23	MG	ACE	MG	ACE	APSP	DRAFT FOR INFORMATION		

REVISION | REFERENCE DRAWINGS

GREEN GOLD ENERGY

Lot 315 BOWER ROAD, AUSTRALIA PLAINS
150 MVA PV EXPORT SYSTEM
SITE PLAN

DATE: 09/11/23 | DRN: DS | CHK: ACE | ENG: DS | Q.A: ACE | SCALE: 1:8000
PROJ No: APSP | DRG No | REV: F

AUTOCAD | A1SHEET

Map 2. Proposed project layout (Source: GreenGold Energy provided)

3 HISTORIC HERITAGE ASSESSMENT

3.1 Background

The project area is located within the District Council of Goyder. An understanding of the basic chronology of development in this region has been achieved through reviewing relevant historic heritage and archaeology assessments (see Dallwitz and Marsden 1983, 2012, Flightpath 2000, Flightpath 2000a, Mincham 1977, Donovan 1979).

3.1.1 Settlement survey and sale

The region was first settled in the 1840s (Faull 1979:18) and many early properties were established through 'squatting', with stock being moved about as required by natural feed and water resources (Marsden 1983). Despite the government attempting to regulate land-holding and prevent squatting, no official attempts were made to regulate exploration and land claims until the introduction of occupation licenses in 1842 (Marsden 1983). These licenses were vague as to the extent of the land held and provided no security in terms of land tenure. This insecurity resulted in little effort being made to modify or make improvements to the land (Marsden 1983). The system of licenses continued until the introduction of the *Australian Waste Lands Act of 1855*, which greatly improved security and resulted in the taking up of all suitable grazing land by the 1860's.

Pastoral runs generally employed a few dozen people, who formed a small village at the head station, with smaller numbers situated at out-stations. Apart from a small number of stone walls, the runs were mostly unfenced, due to the high cost of fencing. Generally, the graziers relied on shepherds to keep track of the flocks and look after their wellbeing. Living alone, or more usually in pairs, were a shepherd and a hut-keeper. These workers were scattered across the landscape in tiny wooden huts about five kilometres apart, looking after flocks of perhaps 1,000 sheep (Bell 1993).

Eventually, fences and walls were used to define station boundaries, these usurped the role of the shepherd and contributed to the building of larger and more permanent buildings, such as boundary riders' huts, and virtual villages clustered about an increasingly substantial station homestead (Marsden 1983).

Land reform legislation from the late 1860s, resulted in an influx of wheat farmers and the transformation of an enormous area of land from pastoral to agricultural use in the space of less than a decade (Flightpath 2000:9). During this period, the grazing land and uncleared bush were transformed into ploughed fields suitable for cropping (Flightpath 2000:12). The sale of millions of acres of land at £2 per acre made a major contribution to South Australia's great agricultural boom of the late 1870s (Flightpath et al. 2000:12).

The small town of Australia Plains had a post office, a school, and a number of small residential dwellings. The post office operated from 1882 to 1971, and a public school operated from 1917 until 1956 (Dreckow 1986). The school replaced an earlier Lutheran school that was forced to close during World War I (Dreckow 1986).

3.2 Archaeological Context

A review of this information has allowed us to produce a scope of archaeological evidence, or in other words, what could remain within the overall project area as physical evidence of the evolution of this place as part of the European settlement of the region. This may be summarised as follows:

- Evidence of the original environmental conditions including palynological evidence of the soft landscape which could be found in undeveloped parts of the project area.
- Evidence of early exploration and land allocation (survey markers)
- Evidence of the first settlement of the area could include evidence of temporary huts, early outhouses and farm infrastructure in the form of post-holes, remnant foundations, formed surfaces and particularly artefacts in the form of scatters or discrete assemblages which could be found anywhere outside of the previously developed roadways.

Sometimes evidence of earlier phases of development is completely removed during successive phases, at other times it is modified or adapted or simply built over. Considering the location of the project area, coupled with the existing land use, there is a low risk of works encountering previously unknown archaeological features of significance.

3.3 State and Commonwealth Historic Heritage Registers

The methodology undertaken for assessing the built heritage values of the project area included reviewing the following registers, databases and documents:

- The Australian Heritage Database – for world heritage places, national heritage places and commonwealth heritage places
- The South Australian Heritage Places Database – for places of state and local heritage significance

Archival records from the South Australian Archives, the State Library of South Australia and National Library of Australia were also accessed for information about the general region. Reference was made to historic plans, aerial photographs, academic studies and other records to build a picture of the gradual development of the region.

Each register was searched using GIS shape files of the project area. There are no heritage places listed within or adjacent to the current project area.

3.4 Historic Heritage Legislation

The following key pieces of legislation were designed to protect and manage built heritage and significant archaeological features.

3.4.1 Commonwealth Environment Protection & Biodiversity Conservation Act 1999 (amended 2003)

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA) protects places of national cultural and environmental significance from damage and interference by establishing a National Heritage list (for places outside of Commonwealth land) and a Commonwealth Heritage List (for places within Commonwealth land). Under the EPBCA any action that has, will have, or is likely to have a significant impact on a place of national cultural and/or environmental significance must be

referred to the Minister for the Environment for approval. The EPBCA sets out a procedure for obtaining approval, which may include the need to prepare an environmental impact statement for the proposed action (an action is defined in section 523 to include a project, development or undertaking or an activity or series of activities).

The EPBCA is only relevant to a project where a project area contains a site that has been entered onto the National Heritage List or the Register of the National Estate. If not, there is no current referral process required to the Commonwealth Department for Environment under the EPBCA.

3.4.2 South Australian Heritage Places Act 1993

The *Heritage Places Act 1993* (HPA) makes provision for the identification, recording and conservation of places and objects of non-Indigenous heritage significance in South Australia. The Act establishes the South Australian Heritage Council and allows for the identification and protection of places of heritage significance. The South Australian Heritage Register lists all places of heritage significance to South Australia. Heritage Places and objects must meet criteria outlined in section 15 of the Act. Once registered, state heritage places are protected under both the HPA and the *Development Act 1993*/*Planning, Development and Infrastructure Act* 2016. Any impacts to a state heritage place are considered development and as such requires development approval.

The HPA also includes provision for the protection of all archaeological resources. Under sections 26, 27 and 28 it is an offence to carry out the following actions without a permit from the South Australian Heritage Council:

- Excavate or disturb a state heritage place designated as a place of archaeological significance; or remove archaeological artefacts from such a place.
- Excavate or disturb any land (not designated as a place of archaeological significance) for the purpose of searching for or recovering archaeological artefacts of heritage significance; or excavate or disturb any land (not designated as a place of archaeological significance) knowing or having reasonable cause to suspect that the excavation or disturbance will or is likely to result in an archaeological artefact of heritage significance being discovered, exposed, moved, damaged or destroyed.
- Damage, destroy or dispose of an archaeological artefact removed from a state heritage place designated as a place of archaeological significance (whether removed before or after the entry of that place in the Register) and to damage, destroy or dispose of an object entered in the Register (either as a provisional or confirmed entry).

Penalties for any offences under section 26, 27 and 28 of the HPA are up to $75,000.

Under section 36 of the HPA, a person who intentionally or recklessly damages a heritage place or engages in conduct, knowing that it will or might destroy or reduce the significance of a state heritage place can be fined a maximum penalty of $120,000.

3.4.3 South Australian Planning, Development and Infrastructure Act 2016

The *Planning, Development and Infrastructure Act 2016* (PDIA) is the principal legislation to facilitate the planning and development in South Australia as of July 2020. The PDIA allows local governments (councils) to include places of local heritage into a planning and design code which replace council

development plans. The Act deals with planning and development measures in South Australia and more specifically with proposed activity which may materially affect heritage places of local or state significance.

Where works are to take place on land parcels containing state heritage items, and that work could materially affect the heritage value of the place, this constitutes development as defined by the PDIA and may require preparation of a heritage impact assessment to mitigate impact and a development application prior to works commencing. Where works are to take place on land parcels containing local heritage items, and the work could materially affect the heritage value of the place, this constitutes development as defined by the PDIA and a development application may be required prior to works commencing. Where work is likely to impact archaeological deposits, a permit is still required from the South Australian Heritage Council.

3.5 Non-Statutory

There are a number of important non-statutory documents used in heritage best practice to inform the management of significant sites and resources but which are not legally binding. One such document is The Burra Charter.

3.5.1 The Burra Charter (1979) - Amended 2013

The International Council on Monuments and Sites (ICOMOS) Charter for the Conservation of Places of Cultural Significance is known as The Burra Charter. The Burra Charter was first adopted in Burra in 1979. It identifies the standard for best practice in the conservation of heritage places in Australia, and state heritage organisations incorporate the principles and logic of this charter into guidelines and other conservation planning documents.

The Burra Charter is important as it outlines the requirements for assessing cultural heritage significance. It is not a legal requirement to adopt the Burra Charter guidelines, however these requirements are reflected in the significance assessment criteria included in section 16 of the HPA.

3.6 Historic Heritage Risk Assessment

The following factors have been taken into consideration to determine the overall heritage context:

- Archaeological and built heritage context
- Previous impacts/ soil profile

3.6.1 Defining Risk

After consideration of the historical land use, the soil profile and the archaeological and built heritage context for the project area, an understanding of the overall heritage context has been developed. A level of risk has then been assigned to each project area, identifying it as a low, moderate or high-risk area.

The following risk matrix illustrates in a simplified way how each level of risk is determined (Table 1). Table 3 contains the overall heritage risk assessment results, where the identified risk level from Table 2 is considered alongside heritage management measures.

Table 1. Risk matrix

		Heritage Context		
Level of impact of previous ground disturbance		**Low risk area**	**Moderate risk area**	**High risk area**
	Significant Impact	Low	Low	Low
	Moderate impact	Low	Moderate	Moderate
	Low Impact	Low	Moderate	High

Table 2. Historic heritage risk assessment

Activity/Incident	Potential Impact	Comments	Initial Risk	Management and Mitigation Measures
Disturbance to known listed (state, local) historic heritage sites.	Breach of HPA and PDIA.	No listed historic heritage sites within or adjacent to the proposed project area.	**None**	• None -required
Accidental disturbance to historic heritage/archaeological features of potential significance.	Breach of HPA.	There are no listed sites adjacent to the project area.. Considering the little information available, this assessment was unable to determine whether any remnants of European built heritage and archaeology remain. If present, these items are likely to include the surviving remnants of farm homesteads, outbuildings, fencing and boundary markers as well as objects more generally associated with agricultural practices (water troughs, remnant fence posts, boundary rider huts etc). The overall risk of impacting historic heritage features of significance at this location is low.	**Low**	• Implementation of unexpected heritage discovery procedure • Heritage site induction

Appendix H

Native Vegetation Clearance

Australia Plains Solar Project – Green Gold Energy

Clearance under the *Native Vegetation Regulations 2017*

2 February 2024

Prepared by Jesse Carpenter – EBS Ecology (NVC Accredited Consultant)

Native Vegetation Clearance Australia Plains Solar Project

02/02/2024

Version 2

Prepared by EBS Ecology for Green Gold Energy

Document Control					
Revision No.	**Date issued**	**Authors**	**Reviewed by**	**Date Reviewed**	**Revision type**
1	08/12/2023	J. Carpenter (NVC Accredited Consultant)	Dr. M. Louter (NVC Accredited Consultant)	11/12/2023	Draft
1.1	31/01/2024	J. Carpenter (NVC Accredited Consultant)	-	-	Draft
2	01/02/2024	J. Carpenter	-	01/02/2024	Final

Distribution of Copies			
Revision No.	**Date issued**	**Media**	**Issued to**
1	12/12/2023	Electronic	Elton Zhang, Green Gold Energy
2	01/02/2024	Electronic	Elton Zhang, Green Gold Energy and Shanti Ditter, Planning Aspects Pty Ltd.

Project Number: EX230719

CITATION: EBS Ecology (2023) Native Vegetation Clearance Australia Plains Solar Project. Report to Green Gold Energy. EBS Ecology, Adelaide.

Cover photograph: Short-beaked Echidna (*Tachyglossus aculeatus*) in Mallee within the Project Area.

EBS Ecology
112 Hayward Avenue
Torrensville, South Australia 5031
T: 08 7127 5607
http://www.ebsecology.com.au
email: info@ebsecology.com.au

Glossary and abbreviations

BAM	Bushland Assessment Method
BDBSA	Biological Database of South Australia (maintained by DEW)
DAWE	Department of Agriculture, Water and the Environment (Commonwealth) (now DCCEEW)
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Commonwealth)
DEH	Department of Environment and Heritage
DEW	Department for Environment and Water (South Australia)
EBS	Environment and Biodiversity Services Pty Ltd (trading as EBS Ecology)
EPBC Act	*Environmental Protection and Biodiversity Conservation Act 1999*
ha	Hectare(s)
IBRA	Interim Biogeographical Regionalisation of Australia
INTG	Iron-grass Natural Temperate Grassland of SA
km	Kilometre(s)
MBC	Mallee Bird Community
MDD	Murray-Darling Depression
NatureMaps	Initiative of DEW that provides a common access point to maps and geographic information about South Australia's natural resources in an interactive online mapping format.
NPW Act	*National Parks and Wildlife Act 1972*
NV Act	*Native Vegetation Act 1991*
NVC	Native Vegetation Council
PMBW	Plains Mallee Box Woodlands
PBGW	Peppermint Box (*Eucalyptus odorata*) Grassy Woodland of SA
PMST	Protected Matters Search Tool (under the EPBC Act; maintained by DAWE)
PV	Photovoltaic
the Project	Australia Plains Solar
the Project Area	Lot 315 Bower Road, Australia Plains (Parcel ID: H120800 S315)
the Proponent	Green Gold Energy Pty Ltd
the Search Area	5 km buffer of the Project Area considered in the desktop assessment database searches.
SA	South Australia(n)
SEB	Significant Environmental Benefit
sp.	Species
spp.	Species (plural)
TEC	Threatened Ecological Community
VA	Vegetation Association
var.	Variety (a taxonomic rank below that of species and subspecies, but above that of form)

TABLE OF CONTENTS

List of Tables

List of Figures

Attachments

Attachment 1 – Spatial data (electronic ESRI shapefile).

Attachment 2 – Significant Environmental Benefit Scoresheets (electronic excel files).

1. APPLICATION SUMMARY

Details of the native vegetation clearance applicant are summarised in Table 1 with a summary of the proposed clearance provided in Table 2.

Table 1. Application details.

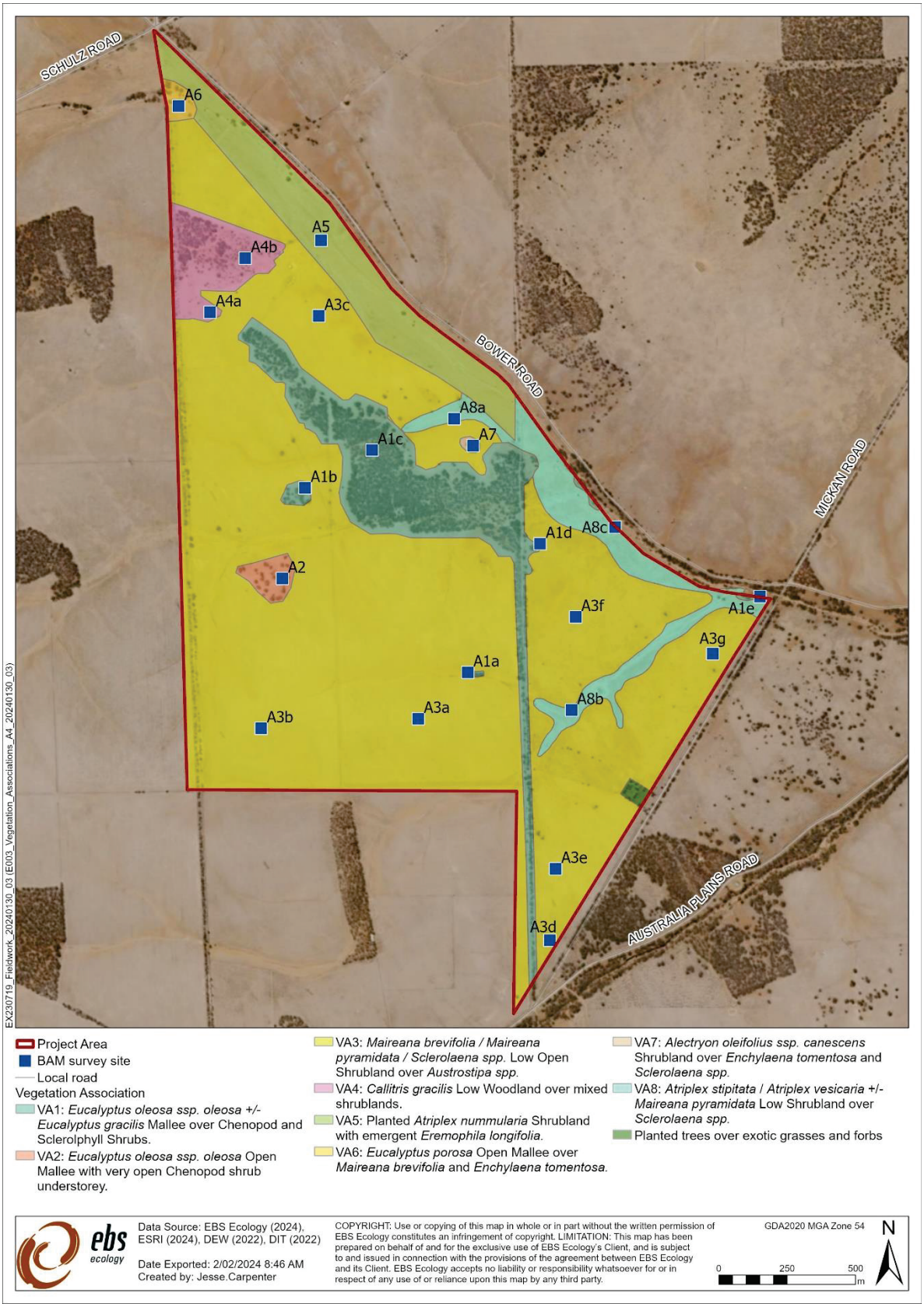
Applicant:	Australia Plains Solar Project Pty Ltd.		
Key contact:	Elton Zhang U1 216 Glen Osmond Road Fullarton SA 5063 Australia M: +61 447 026 237 E: Elton.Zhang@greengoldenergy.com.au		
Landowner:	Australia Plains Solar Project Pty Ltd.		
Site Address:	Lot 315 Bower Road, Australia Plains, SA, 5374		
Local Government Area:	The Regional Council of Goyder	**Hundred:**	English
Title ID:	CT/5972/348	**Parcel ID**	H120800 S315

Table 2. Summary of the proposed clearance.

Purpose of clearance	Clearance required for the construction of a solar farm, Battery Energy Storage System (BESS) and associated infrastructure.
Native Vegetation Regulation	Regulation 12, Schedule 1; clause 34, Infrastructure.
Description of the vegetation under application	Six Vegetation Associations: **VA1:** *Eucalyptus oleosa* ssp. *oleosa* (Red Mallee) Mallee over *Maireana brevifolia* (Short-leaf Bluebush). **VA2:** *Eucalyptus oleosa* ssp. *oleosa* (Red Mallee) Open Mallee with very open understorey. **VA3:** *Maireana brevifolia* (Short-leaf Bluebush)/*Salsola australis* (Buckbush) +/- *Sclerolaena obliquicuspis* (Oblique-spined Bindyi) Low Open Shrubland. **VA4:** *Callitris gracilis* (Southern Cyress Pine) Low Woodland over mixed shrublands. **VA5:** Planted *Atriplex nummularia* (Oldman Saltbush) Shrubland with emergent *Eremophila longifolia* (Weeping Embush). **VA6:** *Eucalyptus porosa* (Mallee Box) Open Mallee over *Maireana brevifolia* (Short-leaf Bluebush) / *Enchylaena tomentosa* (Ruby Saltbush). **VA7:** *Alectryon oleifolius ssp. canescens* (Bullock Bush) shrubland over *Maireana scleroptera* (Hard-wing Bluebush) +/- *Enchylaena tomentosa var.* (Ruby Saltbush).

	VA8: *Atriplex vesicaria* (Bladder Saltbush) low shrubland over *Maireana spp.* (Bluebush) and *Carrichtera annua* (Wards Weed).
Total proposed clearance (ha)	The total proposed area of clearance is 111.50 hectares (ha) of native vegetation, including eight vegetation associations: • A1 – 3.65 ha • A2 – 1.01 ha • A3 – 94.39 ha • A4 – 1.21 ha • A5 – 8.47 ha • A6 – 0.45 ha • A7 – 0.11 ha • A8 – 2.21 ha
Level of clearance	Level 4
Overlay (Planning and Design Code)	Native Vegetation Overlay

Map of proposed clearance area



Mitigation Hierarchy	***Avoidance*** Large areas of suitable habitat for EPBC Act listed threatened species habitat has been avoided by the project design. This includes areas of Mallee and woodland. ***Minimization*** Most of the impact footprint of the Project has been micro-sited to clear vegetation in poorer condition that are heavily impacted by historical land clearing, grazing, and weed infestation. Only smaller patches of vegetation in good to excellent condition, including Mallee and woodland areas. are impacted. Construction contractors will develop and implement a Construction Environmental Management Plan. This plan will include management strategies for minimising the impacts caused by vegetation clearance. ***Rehabilitation or restoration*** Clearance is permanent. No rehabilitation is proposed.
SEB Offset proposal	Total SEB offset required for the clearance of 111.50 ha of native vegetation is 4,089.18 SEB points or payment of $1,500,375.90 into the NV Fund, which includes an administration fee of $78,218.69.

2. PURPOSE OF THE CLEARENCE

2.1. Description

Green Gold Energy Pty Ltd (GGE) is proposing to construct the Australia Plains Solar Farm (the Project) on land they own at Lot 315 Bower Road, Australia Plains (CT/5972/348). The Project is located approximately 12.5 kilometres (km) southeast of the township of Robertstown, and 14.5 km northeast of Eudunda, in the Northern and Yorke region of South Australia (SA).

EBS Ecology (EBS) was engaged by GGE to undertake a native vegetation clearance assessment and prepare a native vegetation clearance report for the construction of the proposed solar farm, BESS, substation, and associated infrastructure required for this its operation within the 180.23 ha area (Figure 1) (the Project Area).

Objectives

The native vegetation assessment, in accordance with the *Native Vegetation Act 1991* (NV Act) and *Native Vegetation Regulations 2017*, had the primary objectives to:

- Undertake a desktop assessment of the likelihood of occurrence and status of threatened flora and fauna protected under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and State *National Parks and Wildlife Act 1972* (NPW Act);
- Assess native vegetation within the Project Area for clearance using the Native Vegetation Council (NVC) endorsed Bushland Assessment Method (BAM) in accordance with the NV Act;
- Identification of any “Declared” plants under the *Landscape South Australia Act 2019* that may be significant in relation to the Project requirements; and
- Calculate the Significant Environmental Benefit (SEB) offset requirements for the Project based on the client supplied impact footprint.

2.2. Background

The Project has been proposed to be constructed on agricultural land in the Regional Council of Goyder within the Northern and Yorke landscape management region and the Hundred of English (DEW 2023a).

Most of the Project Area has been cleared historically of trees and mallee and used for agriculture and livestock grazing. Currently however, there are no grazing activities occurring on the site, with regrowth of native vegetation throughout the site. The Project Area receives approximately 310-325 millimetres (mm) of mean rainfall annually.

No protected areas under the NPW Act are found near the Project Area. There is one Heritage Agreement protected under the NV Act within 5 km of the Project Area (HA886), however it is not impacted by the Project. There are no existing SEB areas protected under the NV Act or any road/rail sites of significance within or surrounding the Project Area (DEW 2023a; DCCEEW 2023a).

Bioregions

Interim Biogeographical Regionalisation of Australia (IBRA) is a landscape-based approach to classifying the land surface across a range of environmental attributes, which is used to assess and plan for the protection of biodiversity. The Project Area is within the Murray Darling Depression IBRA bioregion, Murray Mallee IBRA subregion, and Sutherlands Environmental Association. Approximately 21% (444,401 ha) of the Murray Mallee IBRA Subregion and approximately 47% (32,682 ha) of the Sutherlands Environmental Association is mapped as remnant native vegetation. Of this, 17% (76,180 ha) and 0% (159 ha) is formerly conserved and protected, respectively.

2.3. General location map

The Project Area is shown on the map in Figure 1.

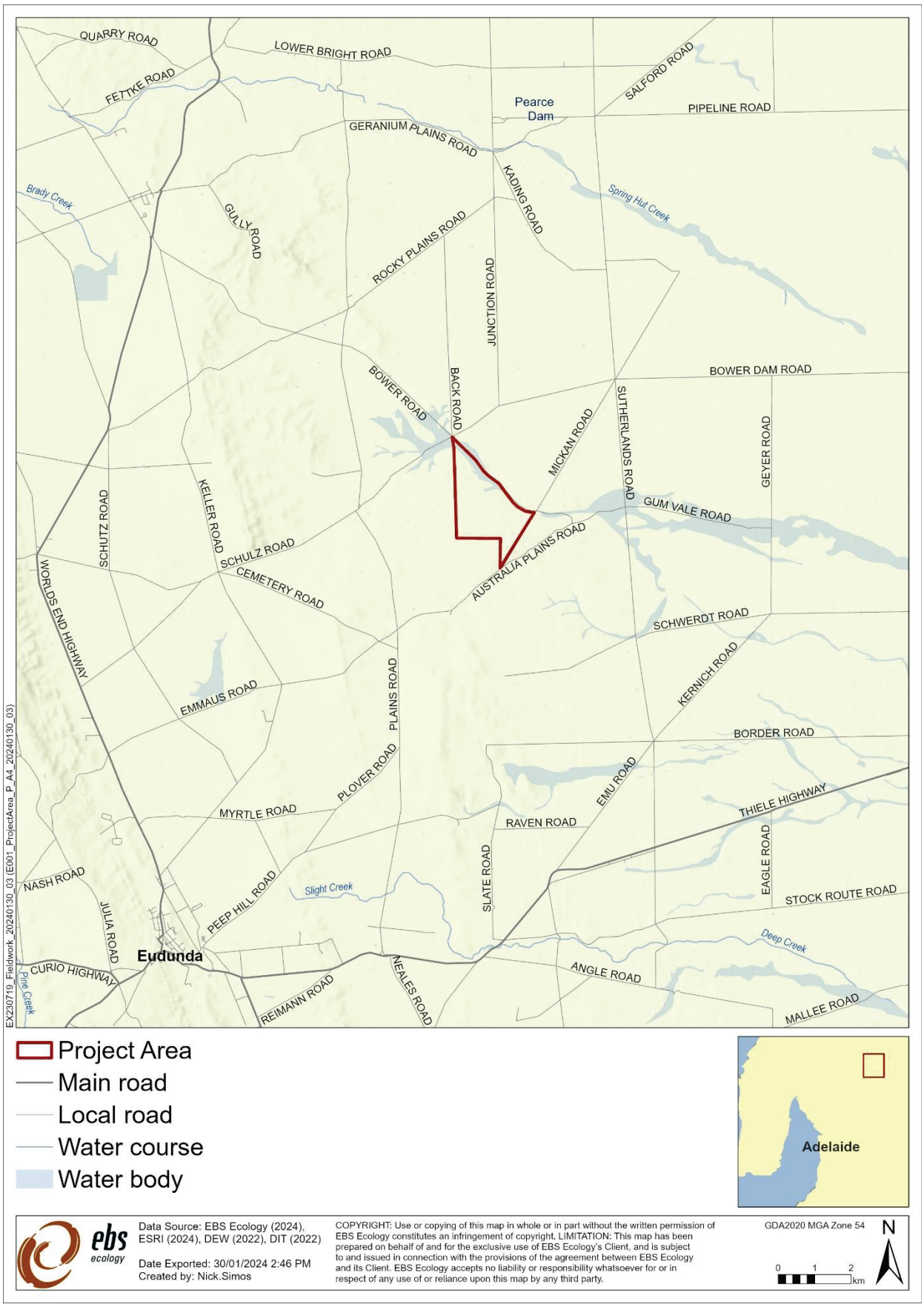


Figure 1. General location of the Project Area.

2.4. Details of the proposal

GGE (the proponent) intends to construct a solar farm, Battery Energy Storage System (BESS) and a substation covering approximately 111.50 ha. The solar farm will be made up of the following infrastructure components:

- Installation of approximately 435,450 solar photovoltaic (PV) panels with a total export capacity of 200 MW. Panels will be attached to trackers in a 2P (or vertical two-panel) arrangement with approximately 4032 rows of trackers, each containing around 108 PV panels, distributed across the site Figure 2.
- Installation of underground cabling connecting the PV panels to Inverters and inverters to the on-site substation.
- Development of an on-site substation located in the south-western corner of the site, near the existing 275 kilovolt transmission lines which traverse the at that location.
- Installation of an overhead transmission line connecting the on-site substation to the transmission network.
- Development of buildings and structures to support the operation of the solar farm, including:
    - Site offices (containers); and
    - storage containers housing equipment, general items, and staff amenities.
- Installation of rainwater tanks for fire-fighting purposes (with the precise number and location to be determined in liaison with the SA Country Fire Service).
- Development of two site access points on the northern boundary of the site as follows:
    - at the intersection of Bower and Junction Roads; and
    - off Bower Road approximately 340 metres north-west of the intersection of Bower and Junction Roads.
- Development of internal access roads / tracks within the subject site.
- Installation of closed-circuit TV devices.
- Development of cyclone mesh security fencing around the perimeter of the site.

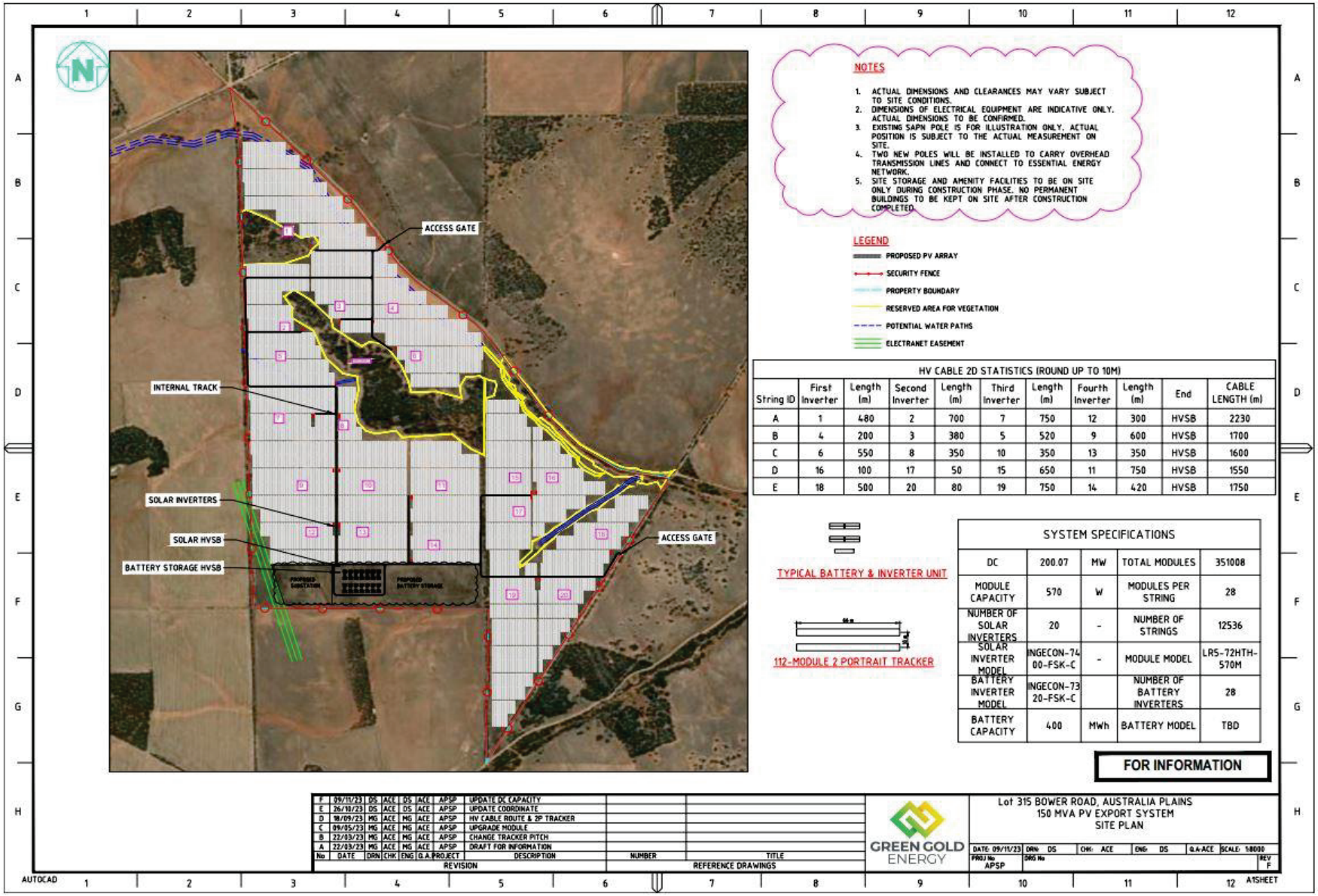


Figure 2. Site Plan provided by GGE (supplied to EBS on 15/01/2024).

2.5. Approvals required *or* obtained.

- ***Native Vegetation Act 1991*** – The Project Area is within the area covered by the native Vegetation Overlay. Clearance of native vegetation will require approval under the *Native Vegetation Act 1991* (NV Act).
- ***Planning, Development and Infrastructure Act 2016*** – approval is required under the Planning, *Development and Infrastructure Act 2016* (PDI Act). A Development Application (DA) is currently in preparation.
- ***Environment Protection and Biodiversity Conservation Act 1999*** – Matters of National Significance (MNES) are protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Although several MNES (threatened species) have been identified as potentially occurring in or near the Project Area, potential habitat for these species has been avoided by the Project. It is therefore unlikely that any MNES will be significantly impacted by the Project, although a formal significant impact assessment has not been undertaken.
- ***National Parks and Wildlife Act 1972*** – EBS Ecology holds the required scientific permit for the collection of native flora and fauna under the *National Parks and Wildlife Act 1972* (NPW Act): Scientific Research Licence K25613-23.
- ***Landscapes South Australia Act 2019*** – During construction, a permit may be required to transport plants Declared under the Landscapes South Australia Act 2019 (LSA Act) on a public road.
- ***Aboriginal Heritage Act 1988*** – approval will be required if any sites, objects or remains are uncovered during the works. A 'Stop Work' procedure should be implemented if any items of this nature are located.

2.6. Native Vegetation Regulation

The proposal will be assessed under Regulation 12, Schedule 1; clause 34 (Infrastructure) of the *Native Vegetation Regulations 2017.*

2.7. Development Application information

DA information that is relevant to this native vegetation clearance application is listed in Table 3.

Table 3. Development Application information

Local Government Area	The Regional Council of Goyder
Hundred	English
Parcel	H120800 S315
Title	CT/5972/348
Zone	Rural
Overlays	Native Vegetation, Hazards (Bushfire – Regional), Hazards (Flooding – Evidence required), Murray Darling Basin, water resources
DA number	In preparation.

3. METHOD

3.1. Flora assessment

The flora assessment was undertaken by NVC Accredited Consultant J. Carpenter and Graduate Ecologist C.J. Panozzo on the 28/09/2023 in accordance with the Bushland Assessment Method (BAM) (NVC 2020a). An assessment was also undertaken by EBS Ecology in May 2021.

3.1.1. Bushland Assessment Method

The BAM is derived from the Nature Conservation Society of SA's Bushland Condition Monitoring methodology (Croft *et al.* 2007, 2008a, 2008b, 2009; Milne and Croft 2012; Milne and McCallum 2012). The BAM is used to assess areas of native vegetation requiring clearance and calculate the SEB requirements.

Details of site selection/stratification and assessment protocols, and the biodiversity value components assessed and the factors that influence these components are outlined in the *Bushland Assessment Manual* (NVC 2020a).

The Conservation Significance Scores were calculated from direct observations of flora and direct and historical observations of fauna species of conservation significance. All fauna identified as known or likely to occur in the Protected Matters Search Tool (PMST), and fauna with Biological Database of South Australia (BDBSA) records since 1995 and with a spatial reliability of less than 1 km, within 5 km of the Project Area, were included in the BAM scoresheets. Species determined as unlikely to occur within the Project Area will be removed by the Native Vegetation Branch if the finding is supported. Marine and/or wetland species were omitted from the scoresheets given the Project Area is terrestrial.

3.1.2. Provisional List of Threatened Ecosystems

The *Provisional List of Threatened Ecosystems* (DEH 2005) was reviewed to determine whether any vegetation associations impacted meet the criteria for listing as a threatened ecosystem at the state level.

3.2. Fauna assessment

A desktop assessment was undertaken to determine the potential for any threatened fauna species and threatened ecological communities (TEC) to occur within the Project Area. This included species listed under both the EPBC Act and the NPW Act.

The search was undertaken by applying a 5 km buffer around the Project Area, referred to as the Search Area. The following databases were searched to obtain records of threatened species:

- Protected Matters Search Tool (PMST) - Report generated by the Department of Climate Change, Energy, Environment and Water (DCCEEW) to identify any MNES that may or are known to occur in the search Area.
- Biological Database of South Australia (BDBSA) - Data extract obtained from the Department for Environment and Water (DEW) that identifies the location of historical records of flora and fauna in the Search Area.

3.2.1. Protected Matters Search Tool report

A PMST report was generated on 14 November 2023 to identify flora, fauna, and TEC listed under the EPBC Act as threatened or migratory (DCCEEW 2023a). Only species and TEC identified in the PMST report as known to occur within the Search Area were assessed for their likelihood of occurrence within the Project Area.

Species identified as known to occur were entered into the scoresheets for the purposes of calculating the threatened fauna score, conservation significance score and SEB obligations of the clearance. Species assessed as unlikely to occur in the Project Area may be removed by NVC during the approvals process.

3.2.2. Biological Database of South Australia data extract

A data extract from the BDBSA was obtained from NatureMaps to identify flora and fauna species that have been recorded within 5 km of the Project Area (data extracted 12/09/2023; DEW 2023b; Recordset number DEWNRBDBSA30912-4).

The BDBSA is comprised of an integrated collection of species records from the SA Museum, conservation organisations, private consultancies, Birds SA, Birdlife Australia, and the Australasian Wader Study Group, which meet the DEW's standards for data quality, integrity, and maintenance. Only species with records since 1995 and a spatial reliability of less than 1 km were assessed for their likelihood of occurrence.

All threatened fauna identified by the BDBSA extract were entered into the scoresheets for the purposes of calculating the threatened fauna score, conservation significance score and SEB obligations of the clearance. Species assessed as unlikely to occur in the Project Area may be removed by NVC during the approvals process.

3.2.3. Literature Review

Existing information and literature relevant to the Project Area was reviewed, including:

- Aerial imagery;
- Spatial datasets, e.g., DEW biological survey sites, IBRA, vegetation cover, protected areas, vegetation floristic mapping, surface and ground water and roadside significant sites from NatureMaps (DEW 2023a); and
- Reports, plans and web-based information, including:
    - SA Planning and Design Code, Part 10;
    - SA Planning and Property Atlas; and
    - EPBC Act species profiles, conservation advice and recovery plans.

The above resources were used to assess:

- Vegetation cover within the Project Area and immediate surrounds;
- Potential Vegetation Associations present (including TECs); and
- Flora and fauna species of conservation significance known or likely to occur within the Project Area.

3.2.4. Field survey

Fauna surveys were conducted in conjunction with the vegetation assessment. Weather conditions during the survey were favourable, with recent rain and mild daytime temperatures.

All native and exotic fauna species opportunistically encountered (directly observed, or tracks, scats, burrows, nests, and other signs of presence) during the native vegetation clearance assessment were recorded. Potential fauna refuge sites, such as hollows, were noted as an indication of availability of suitable habitat. Particular attention was paid to identifying habitat for threatened species identified in the desktop assessment. For each opportunistic fauna observation, the species, number of individuals, GPS location, detection methodology (sight, sound, or sign) and habitat were recorded.

In addition to opportunistic records, 2 dedicated 20-minute, ~2-hectare (ha) bird surveys (Birdlife Australia 2023) were undertaken during the field survey in each broad vegetation association. At each survey site, the observer walked through similar vegetation recording all birds seen and heard during a timed 20-minute period. For each sighting the species and number of individuals were recorded.

3.2.5. Likelihood of occurrence

Threatened species and TECs that were identified by the desktop assessment were assessed for their likelihood of occurrence in the Project Area. All species with historical records since 1995 with a spatial reliability of <1 km and species listed as ‘known to occur’ by the PMST report were assessed.

The assessment was based on recency or records, habitat preferences and the results of the field survey, with criteria for the likelihood of occurrence described in Table 4. All marine, wetland and aquatic species were not assessed (besides migratory species), as the search area contained or associated any of these habitats.

Table 4. Criteria for the likelihood of occurrence of threatened species within the Project Area.

Likelihood	Criteria
Highly Likely/Known	Recorded in the last 10 years, the species does not have highly specific niche requirements, the habitat is present and falls within the known range of the species distribution or; The species was recorded as part of field surveys.
Likely	Recorded within the previous 20 years, the area falls within the known distribution of the species and the area provides habitat or feeding resources for the species.
Possible	Recorded within the previous 20 years, the area falls inside the known distribution of the species, but the area provides limited habitat or feeding resources for the species. Recorded within 20 - 40 years, survey effort is considered adequate, habitat and feeding resources present, and species of similar habitat needs have been recorded in the area.
Unlikely	Recorded within the previous 20 years, but the area provides no habitat or feeding resources for the species, including perching, roosting or nesting opportunities, corridor for movement or shelter. Recorded within 20 - 40 years; however, suitable habitat does not occur, and species of similar habitat requirements have not been recorded in the area. No records despite adequate survey effort.

3.3. Limitations

The desktop assessment was based on existing datasets and references from a range of sources. EBS Ecology has not attempted to verify the accuracy of any such information. The findings and conclusions expressed by EBS Ecology are based solely upon information in existence at the time of the assessment.

Flora and fauna records were retrieved from the PMST and BDBSA extract. The BDBSA only includes verified flora and fauna records submitted to DEW or partner organisations. It is recognised that information is imperfectly captured, and it is possible that significant species may occur in the Project Area that are not reflected by database records. Although much of the BDBSA data has been through a variety of validation processes, the lists may contain errors and should be used with caution. DEW gives no warranty that the data is accurate or fit for any particular purpose of the user or any person to whom the user discloses the information.

No species-specific targeted flora or fauna surveys were undertaken.

3.3.1. Spatial data limitations

All spatial data has been captured or converted to the following coordinate reference system.

Datum: Geocentric Datum of Australia 2020 (GDA2020).

Projection: Map Grid of Australia 2020 (MGA2020), Zone 54.

All location coordinates listed in this report are expressed using this system. Spatial data converted from other coordinate reference systems may have accuracy limitations.

4. ASSESSMENT OUTCOMES

4.1. Vegetation assessment

4.1.1. General description of the vegetation, the site and matters of significance.

Most of the Project Area has been historically cleared of woodland and mallee vegetation. There is evidence of previous cropping activity, although this has not occurred for some years, with cleared areas vegetated by regenerating low shrub communities. Most recently, land use has been predominantly grazing of native pasture. A small area in the north has been planted with *Atriplex nummularia* for stock fodder.

Vegetation condition reflects the historical land use. Vegetation is generally in poor to moderate condition, with weed cover high at some locations and evidence of past heavy grazing pressure. Remaining mallee vegetation has only sparse understorey cover with few grass and shrub species, possibly due to past grazing activities.

Most of the Project Area consists of Chenopod shrublands which is dominated by *Maireana spp.*, *Sclerolaena spp.* and *Atriplex* spp. There are small patches of Mallee, mostly at the boundaries of the Project Area, although a large patch of mallee occurs through the central Project Area which is planned on being avoided. An *Atriplex nummularia* plantation is located at the southern boundary.

Eight vegetation associations were identified in the Project Area, listed below:

- **A1:** *Eucalyptus oleosa ssp. oleosa +/- Eucalyptus gracilis* Mallee over Chenopod and Sclerophyll Shrubs.
- **A2:** *Eucalyptus oleosa ssp. oleosa* (Red Mallee) Open Mallee with very open understorey.
- **A3:** *Maireana brevifolia / Maireana pyramidata / Sclerolaena* spp. Low Open Shrubland over *Austrostipa* spp.
- **A4:** *Callitris gracilis* Low Woodland over mixed shrublands.
- **A5:** Planted *Atriplex nummularia* Shrubland with emergent *Eremophila longifolia*.
- **A6:** *Eucalyptus porosa* Open Mallee over *Maireana brevifolia* and *Enchylaena tomentosa*.
- **A7:** *Alectryon oleifolius ssp. canescens* (Bullock Bush) shrubland over *Enchylaena tomentosa* and *Sclerolaena* spp.
- **A8:** *Atriplex stipitata / Atriplex vesicaria +/- Maireana pyramidata* Low Shrubland over *Sclerolaena* spp.

These vegetation associations are described in Section 4.1.2 and mapped in Section 4.1.4. A small extent of the eastern Project Area consists of planted trees over an understorey of introduced grasses and forbs.

Throughout the Project Area 60 flora species were recorded, listed in Appendix 1. This includes 14 introduced plants, or weeds. Only one weed species that is Declared under the LSA Act was found, being African Box-thorn (*Lycium ferocissimum*).

4.1.2. Benchmark Communities

Although now dominated by chenopod shrublands, the Project Area was most likely vegetated with open mallee and woodland prior to clearing for agriculture. This is evidenced by the presence of emergent trees, long dead trees and dead timber and stumps within shrubland communities. Remnant vegetation inside road reserves and on fence lines also consists of mallee or woodland.

For this reason, the following benchmark community has been selected for assessing the condition of the A3 vegetation association:

- MDBSA 2.1: Open Mallee / Low Open Woodland with Chenopod Shrub Understorey.

4.1.3. Details of the vegetation associates proposed to be impacted.

All vegetation associations will be impacted by the clearance. These associations are described in further detail in Table 5 to Table 12.

Table 5. Summary of A1.

<table>
<tr><td>Vegetation Association</td><td colspan="3">A1; Eucalyptus oleosa ssp. oleosa +/- Eucalyptus gracilis Mallee over Chenopod and Sclerophyll Shrubs.</td></tr>
<tr><td>Benchmark Community</td><td colspan="3">MDBSA 3.2: Mallee with Open Sclerophyll / Chenopod Shrub Understorey.</td></tr>
<tr><td colspan="2"> 
BAM Site A1a, looking south.</td><td colspan="2"> 
BAM Site A1b, looking south.</td></tr>
<tr><td colspan="2"> 
BAM Site A1c, looking south.</td><td colspan="2"> 
BAM Site A1d, looking south.</td></tr>
<tr><td rowspan="3">General description</td><td colspan="3">Dense Eucalyptus oleosa spp. dominant Mallee over relatively diverse chenopod shrubland with limited native grass species. Understorey dominated by non-native species.</td></tr>
<tr><td>Over storey</td><td>Mid storey</td><td>Under storey</td></tr>
<tr><td>Eucalyptus oleosa spp.</td><td>Maireana brevifolia
Enchylaena tomentosa var.
Atriplex stipitata
Roepera aurantiaca ssp.</td><td>Rytidosperma sp.
Austrostipa nitida
Carrichtera annua
Hordeum sp.</td></tr>
<tr><td>Threatened species or community</td><td colspan="3">This vegetation association meet the requirements of a threatened community, being;
• Mallee Birds Community of the Murray Darling Depression Bioregion.

One threatened fauna species was recorded in this vegetation association:
• White-winged Chough (Corcorax melanorhamphos): NPW Act – Rare.</td></tr>
</table>

<table>
<tr><td></td><td colspan="5">Although no recorded during the survey, the vegetation may provide some limited habitat for the following threatened fauna species:
Southern Whiteface (Aphelocephala leucopsis leucopsis): EPBC Act – Vulnerable;
Jacky Winter (Microeca fascinans fascinans): NPW Act -Rare;
South-eastern Hooded Robin (Melanodryas cucullata cucullata): EPBC Act - Endangered & NPW Act – Rare; and
Painted Honeyeater (Grantiella picta): EPBC Act - Vulnerable & NPW Act – Rare.</td></tr>
<tr><td>Landscape context score</td><td>1.15</td><td>Vegetation Condition Score</td><td>Range: 36.04 – 57.75
Mean: 41.99</td><td>Conservation significance score</td><td>1.5</td></tr>
<tr><td>Unit biodiversity Score</td><td>Range: 62.18 – 99.62
Mean: 72.44</td><td>Area (ha)</td><td>3.65</td><td>Total biodiversity Score</td><td>Range: 226.94 – 363.61
Mean: 193.89</td></tr>
</table>

Table 6. Summary of A2.

<table>
<tr><td>Vegetation Association</td><td colspan="5">A2; Eucalyptus oleosa ssp. oleosa Open Mallee with very open Chenopod shrub understorey.</td></tr>
<tr><td>Benchmark Community</td><td colspan="5">MDBSA 3.2: Mallee with Open Sclerophyll / Chenopod Shrub Understorey.</td></tr>
<tr><td colspan="6"> 
BAM Site A2, looking south.</td></tr>
<tr><td rowspan="2">General description</td><td colspan="5">Open Eucalyptus oleosa spp. Mallee over chenopod shrublands with low grass cover understorey. The association differs from VA1 due to being more open.</td></tr>
<tr><td colspan="5"><table>
<tr><th>Over storey</th><th>Mid storey</th><th>Under storey</th></tr>
<tr><td>Eucalyptus oleosa spp.</td><td>Maireana brevifolia
Sclerolaena obliquicuspis
Enchylaena tomentosa var.
Roepera aurantiaca ssp.</td><td>Austrostipa nitida
Hordeum sp.</td></tr>
</table></td></tr>
<tr><td>Threatened species or community</td><td colspan="5">This vegetation association did not meet the requirements of a threatened community.
Although no recorded during the survey, the vegetation may provide some limited habitat for the following threatened fauna species:
• Southern Whiteface (Aphelocephala leucopsis leucopsis): EPBC Act – Vulnerable;
• Jacky Winter (Microeca fascinans fascinans): NPW Act -Rare;
• South-eastern Hooded Robin (Melanodryas cucullata cucullata): EPBC Act - Endangered & NPW Act – Rare;
• Painted Honeyeater (Grantiella picta): EPBC Act - Vulnerable & NPW Act – Rare; and
• White-winged Chough (Corcorax melanorhamphos): NPW Act – Rare.</td></tr>
<tr><td>Landscape context score</td><td>1.15</td><td>Vegetation Condition Score</td><td>25.12</td><td>Conservation significance score</td><td>1.1</td></tr>
<tr><td>Unit biodiversity Score</td><td>31.77</td><td>Area (ha)</td><td>1.01</td><td>Total biodiversity Score</td><td>32.09</td></tr>
</table>

Table 7. Summary of A3.

Vegetation Association	**A3;** *Maireana brevifolia / Maireana pyramidata / Sclerolaena* spp. Low Open Shrubland over *Austrostipa* spp.
Benchmark Community	MDBSA 2.1: Open Mallee / Low Open Woodland with Chenopod Shrub Understorey.

BAM Site A3a, looking south.

BAM Site A3b, looking south.

BAM Site A3c, looking south.

BAM Site A3d, looking west.

BAM Site A3e, looking west.

BAM Site A3f, looking south.

<table>
<tr><td rowspan="3">General description</td><td colspan="5">Low open chenopod shrubland dominated by Maireana brevifolia, Salsola australis, and Sclerolaena obliquicuspis over Austrostipa spp.</td></tr>
<tr><td colspan="2">Over storey</td><td colspan="2">Mid storey</td><td>Under storey</td></tr>
<tr><td colspan="2">Absent</td><td colspan="2">Maireana brevifolia
Salsola australis
Sclerolaena obliquicuspis</td><td>Austrostipa nitida
Austrostipa acrociliata
Hordeum sp.</td></tr>
<tr><td>Threatened species or community</td><td colspan="5">This vegetation association did not meet the requirements of a threatened community.

Although no recorded during the survey, the vegetation may provide some limited habitat for the following threatened fauna species:
• Jacky Winter (Microeca fascinans fascinans): NPW Act -Rare; and
• Blue-winged Parrot (Neophema chrysostoma): EPBC Act - Vulnerable & NPW Act – Vulnerable.</td></tr>
<tr><td>Landscape context score</td><td>1.12</td><td>Vegetation Condition Score</td><td>Range: 20.03 – 36.61
Mean: 25.98</td><td>Conservation significance score</td><td>1.1</td></tr>
<tr><td>Unit biodiversity Score</td><td>Range: 25.33 – 46.31
Mean: 32.86</td><td>Area (ha)</td><td>94.39</td><td>Total biodiversity Score</td><td>Range: 2,391.05 – 4,371.66
Mean: 3101.66</td></tr>
</table>

Table 8. Summary of A4.

<table>
<tr><td>Vegetation Association</td><td colspan="5">A4; Callitris gracilis Low Woodland over mixed shrublands.</td></tr>
<tr><td>Benchmark Community</td><td colspan="5">MDBSA 1.1: Open Woodland with Open Arid adapted Shrub Understorey on Limestone Plains.</td></tr>
<tr><td colspan="6"> 
BAM A4a, looking south.
 
BAM A4b, looking south.</td></tr>
<tr><td rowspan="2">General description</td><td colspan="5">Low woodland dominated by Callitris gracilis over mixed shrublands consisting of Maireana spp., acacia spp., Enchylaena tomentosa, and Roepera aurantiaca with a Austrostipa and Rytidosperma under storey.</td></tr>
<tr><td>Over storey</td><td colspan="2">Mid storey</td><td colspan="2">Under storey</td></tr>
<tr><td>Callitris gracilis
Senna artemisioides ssp. filifolia</td><td colspan="2">Maireana brevifolia
Maireana georgei
Roepera aurantiaca ssp.
Enchylaena tomentosa var.
Eremophila longifolia
Acacia oswaldii
Acacia myrtifolia</td><td colspan="2">Austrostipa nitida
Rytidosperma sp.</td></tr>
<tr><td>Threatened species or community</td><td colspan="5">This vegetation association did not meet the requirements of a threatened community.
Although no recorded during the survey, the vegetation may provide some limited habitat for the following threatened fauna species:
• Southern Whiteface (Aphelocephala leucopsis leucopsis): EPBC Act – Vulnerable;
• Jacky Winter (Microeca fascinans fascinans): NPW Act -Rare;
• South-eastern Hooded Robin (Melanodryas cucullata cucullata): EPBC Act - Endangered & NPW Act – Rare;
• Painted Honeyeater (Grantiella picta): EPBC Act - Vulnerable & NPW Act – Rare; and
• White-winged Chough (Corcorax melanorhamphos): NPW Act – Rare.</td></tr>
<tr><td>Landscape context score</td><td>1.15</td><td>Vegetation Condition Score</td><td>Range: 47.15 – 49.78
Mean: 48.47</td><td>Conservation significance score</td><td>1.1</td></tr>
<tr><td>Unit biodiversity Score</td><td>Range: 59.64 – 62.97
Mean: 61.31</td><td>Area (ha)</td><td>1.12</td><td>Total biodiversity Score</td><td>Range: 72.17 – 76.20
Mean: 74.19</td></tr>
</table>

Table 9. Summary of A5.

<table>
<tr><td>Vegetation Association</td><td colspan="5">A5; Planted Atriplex nummularia Shrubland with emergent Eremophila longifolia.</td></tr>
<tr><td>Benchmark Community</td><td colspan="5">MDBSA 2.1: Open Mallee / Low Open Woodland with Chenopod Shrub Understorey.</td></tr>
<tr><td colspan="6"> 
BAM A5a, looking south.</td></tr>
<tr><td rowspan="3">General description</td><td colspan="5">Planted Atriplex nummularia shrubland with emergent Eremophila longifolia and Sclerolaena obliquicuspis, over Austrostipa acrociliata and Rytidosperma sp.</td></tr>
<tr><td colspan="2">Over storey</td><td colspan="2">Mid storey</td><td>Under storey</td></tr>
<tr><td colspan="2">Absent</td><td colspan="2">Atriplex nummularia
Eremophila longifolia
Sclerolaena obliquicuspis</td><td>Austrostipa acrociliata
Rytidosperma sp.</td></tr>
<tr><td>Threatened species or community</td><td colspan="5">This vegetation association did not meet the requirements of a threatened community.

Although no recorded during the survey, the vegetation may provide some limited habitat for the following threatened fauna species:
• Blue-winged Parrot (Neophema chrysostoma): EPBC Act - Vulnerable & NPW Act – Vulnerable; and
• Jacky Winter (Microeca fascinans fascinans): NPW Act -Rare;</td></tr>
<tr><td>Landscape context score</td><td>1.15</td><td>Vegetation Condition Score</td><td>45.15</td><td>Conservation significance score</td><td>1.1</td></tr>
<tr><td>Unit biodiversity Score</td><td>57.11</td><td>Area (ha)</td><td>8.46</td><td>Total biodiversity Score</td><td>483.19</td></tr>
</table>

Table 10. Summary of A6.

<table>
<tr><td>Vegetation Association</td><td colspan="5">A6; Eucalyptus porosa Open Mallee over Maireana brevifolia and Enchylaena tomentosa.</td></tr>
<tr><td>Benchmark Community</td><td colspan="5">MDBSA: Open Mallee / Low Open Woodland with Chenopod Shrub Understorey.</td></tr>
<tr><td colspan="6"> 
BAM VA6, looking south.</td></tr>
<tr><td rowspan="2">General description</td><td colspan="5">Eucalyptus porosa open mallee over chenopod dominated shrublands with a Rytidosperma sp. and Austrostipa nitida under story.</td></tr>
<tr><td colspan="2">Over storey</td><td colspan="2">Mid storey</td><td>Under storey</td></tr>
<tr><td colspan="2">Eucalyptus porosa</td><td colspan="2">Maireana brevifolia
Enchylaena tomentosa var.
Atriplex stipitate
Rhagodia parabolica
Roepera aurantiaca ssp.</td><td>Rytidosperma sp.
Austrostipa nitida
Hordeum sp.</td></tr>
<tr><td>Threatened species or community</td><td colspan="5">This vegetation association meet the requirements of a threatened community, being;
• Plains mallee box woodlands (PMBW) of the Murray Darling Depression, Riverina, and Naracoorte Coastal Plain Bioregions: EPBC Act - Critically Endangered).

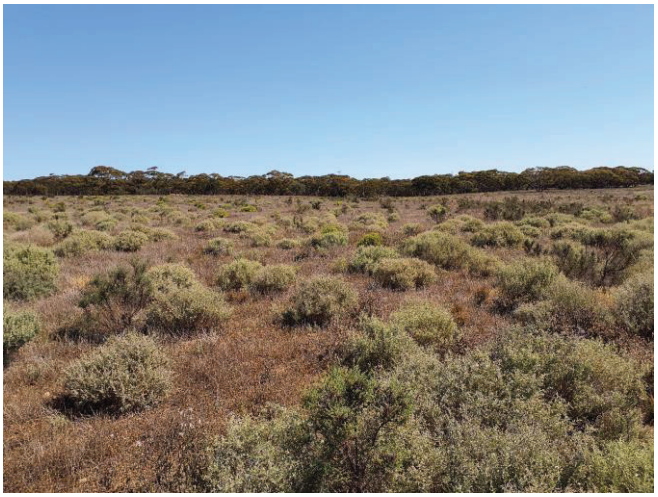
Although no recorded during the survey, the vegetation may provide some limited habitat for the following threatened fauna species:
• Blue-winged Parrot (Neophema chrysostoma): EPBC Act - Vulnerable & NPW Act – Vulnerable;
• Southern Whiteface (Aphelocephala leucopsis leucopsis): EPBC Act – Vulnerable;
• Jacky Winter (Microeca fascinans fascinans): NPW Act -Rare;
• South-eastern Hooded Robin (Melanodryas cucullata cucullata): EPBC Act - Endangered & NPW Act – Rare;
• Painted Honeyeater (Grantiella picta): EPBC Act - Vulnerable & NPW Act – Rare; and
• White-winged Chough (Corcorax melanorhamphos): NPW Act – Rare.</td></tr>
<tr><td>Landscape context score</td><td>1.15</td><td>Vegetation Condition Score</td><td>43.75</td><td>Conservation significance score</td><td>1.5</td></tr>
<tr><td>Unit biodiversity Score</td><td>75.47</td><td>Area (ha)</td><td>0.45</td><td>Total biodiversity Score</td><td>33.96</td></tr>
</table>

Table 11. Summary of A7.

<table>
<tr><td>Vegetation Association</td><td colspan="5">A7; Alectryon oleifolius ssp. canescens shrubland over Enchylaena tomentosa and Sclerolaena spp.</td></tr>
<tr><td>Benchmark Community</td><td colspan="5">MDBSA 1.2: Tall Shrubland with Open Arid adapted Understorey on Limestone Plains.</td></tr>
<tr><td colspan="6"> 
BAM A7, looking east.</td></tr>
<tr><td rowspan="2">General description</td><td colspan="5">Alectryon oleifolius ssp. canescens shrubland over Enchylaena tomentosa and Sclerolaena spp. with an under storey of Austrostipa acrociliata.</td></tr>
<tr><td colspan="2">Over storey</td><td colspan="2">Mid storey</td><td>Under storey</td></tr>
<tr><td colspan="2">Alectryon oleifolius spp. canescens</td><td colspan="2">Maireana scleroptera
Enchylaena tomentosa var.
Roepera apiculata
Sclerolaena obliquicuspis</td><td>Austrostipa acrociliata</td></tr>
<tr><td>Threatened species or community</td><td colspan="5">This vegetation association did not meet the requirements of a threatened community.

Although no recorded during the survey, the vegetation may provide some limited habitat for the following threatened fauna species:
• Southern Whiteface (Aphelocephala leucopsis leucopsis): EPBC Act – Vulnerable;
• Blue-winged Parrot (Neophema chrysostoma): EPBC Act - Vulnerable & NPW Act – Vulnerable; and
• Jacky Winter (Microeca fascinans fascinans): NPW Act -Rare.</td></tr>
<tr><td>Landscape context score</td><td>1.15</td><td>Vegetation Condition Score</td><td>37.21</td><td>Conservation significance score</td><td>1.1</td></tr>
<tr><td>Unit biodiversity Score</td><td>47.07</td><td>Area (ha)</td><td>0.11</td><td>Total biodiversity Score</td><td>5.18</td></tr>
</table>

Table 12. Summary of A8.

<table>
<tr><td>Vegetation Association</td><td colspan="3">A8; Atriplex stipitata / Atriplex vesicaria +/- Maireana pyramidata Low Shrubland over Sclerolaena sp.</td></tr>
<tr><td>Benchmark Community</td><td colspan="3">MDBSA 2.1: Open Mallee / Low Open Woodland with Chenopod Shrub Understorey.</td></tr>
<tr><td colspan="2"> 
BAM A8a, looking south.</td><td colspan="2"> 
BAM A8b, looking south.</td></tr>
<tr><td colspan="2"> 
BAM A8c, looking south.</td><td colspan="2"></td></tr>
<tr><td rowspan="3">General description</td><td colspan="3">Atriplex vesicaria low shrubland over Maireana spp. with an under storey of wards weed.</td></tr>
<tr><td>Over storey</td><td>Mid storey</td><td>Under storey</td></tr>
<tr><td>Absent</td><td>Atriplex vesicaria
Maireana brevifolia
Maireana trichoptera
Sclerolaena obliquicuspis</td><td>Hordeum sp.
Austrostipa acrociliata
Carrichtera annua</td></tr>
<tr><td>Threatened species or community</td><td colspan="3">This vegetation association did not meet the requirements of a threatened community.

Although no recorded during the survey, the vegetation may provide some limited habitat for the following threatened fauna species:
• Jacky Winter (Microeca fascinans fascinans): NPW Act -Rare; and</td></tr>
</table>

	• Blue-winged Parrot (*Neophema chrysostoma*): EPBC Act - Vulnerable & NPW Act – Vulnerable.				
Landscape context score	1.15	**Vegetation Condition Score**	Range: 17.00 – 50.44 Mean: 33.61	**Conservation significance score**	1.1
Unit biodiversity Score	Range: 21.51 – 63.81 Mean: 42.51	**Area (ha)**	2.21	**Total biodiversity Score**	Range: 47.53 – 141.01 Mean: 93.95

4.1.4. Site map showing areas of proposed impact.

Native vegetation under application and the proposed impact of the Proposal/Project are shown on the map in Figure 3.

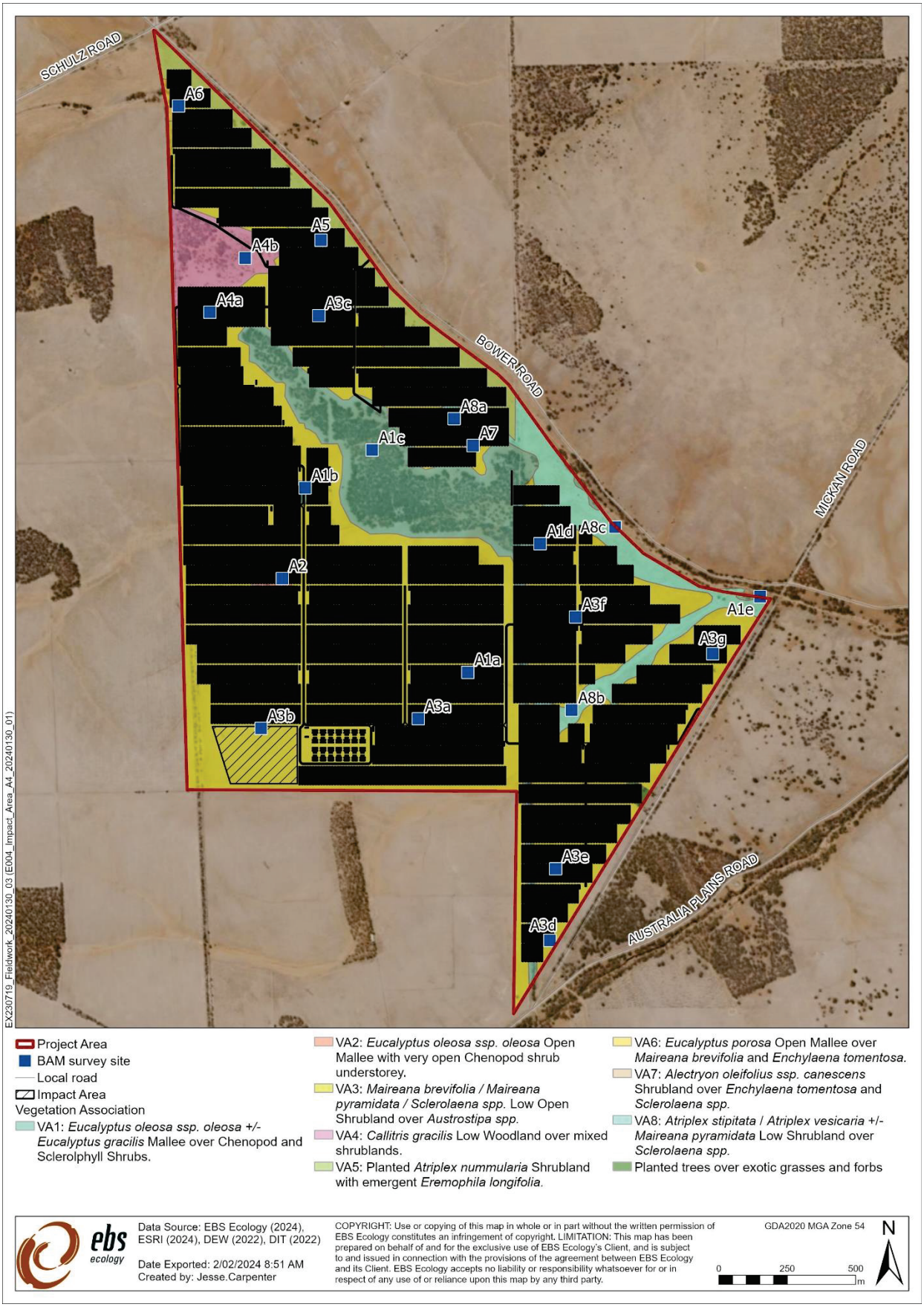


Figure 3. Proposed impact areas and vegetation associations mapped during the 2023 field assessment.

4.2. Threatened species assessment.

This section presents the results of the desktop assessment, including a summary of both the PMST and BDBSA search results, as well as an assessment of the likelihood of identified threatened species and ecological communities occurring in the Project Area.

4.2.1. Threatened Ecological Communities

The PMST search identified five TECs as potentially located within the Project Area. Of these two were identified as occurring in the Project Area and will be impacted:

- Plains mallee box woodlands (PMBW) of the Murray Darling Depression, Riverina, and Naracoorte Coastal Plain Bioregions (EPBC Act: Critically Endangered).
- Mallee Bird Community (MBC) of the Murray Darling Depression Bioregion (EPBC Act: Endangered).

Justification for the above assessment is provided in Table 13 (PMBW) and Table 14 (MBC). These tables assess candidate vegetation associations against the identifying criteria of the relevant TEC.

Table 13. Determining criteria of the Plains Mallee Box Woodlands TEC based on habitat presence, location, and flora species within (DAWE 2021a).

Citeria	Criteria Description (DAWE 2021a)	A6 - *Eucalyptus porosa* Open Mallee over *Maireana brevifolia* and *Enchylaena tomentosa*
1	Occurs in the Murray darling Depression, Riverina, or Naracoorte Coastal Plains	Yes – Murray Darling Depression Bioregion.
2	Occurs on near-level plains or occasionally on gently sloping terrain surrounding and within run-on landscape depressions where soil textures are typically clay loams but may occasionally be sandy clay loams or light clays.	Yes.
3	Primary diagnostic species particular to PMBW are the dominance of box-barked eucalypt species like *Eucalyptus porosa* or *E. behriana*, however other species may dominate (*including E. calycogona* or *E. Dumosa*).	Yes - *Eucalyptus porosa* is the dominant species
4	Mature tree canopy is usually 5-10m tall, but can occasionally occur around 15m, with a tree canopy cover typically 10-15%	Yes.
5	A small tree and/or large shrub layer may be present, but is typically very sparse with < 5% cover and a height range of 3-5 m. A medium shrub layer 1-3 m tall may also be present with typically very sparse cover < 10%. A distinctive low to decumbent chenopod sub-shrub layer can be a key feature in many occurrences. Triodia spp. (spinifex) are typically absent from the ground layer and never dominant	Yes.
Assessment – Vegetation association A6 is the PMBW TEC.		

Table 14. Determining criteria of the Mallee Bird Community TEC based on habitat presence, location, and flora species within (DAWE 2021b).

Citeria	Criteria Description (DAWE 2021b)	A1 - *Eucalyptus oleosa* ssp. *oleosa +/- Eucalyptus gracilis* Mallee over Chenopod and Sclerophyll Shrubs	A2 - *Eucalyptus oleosa* spp. *oleosa* Open Mallee with very open understorey
1	Is the Project Area in any of the following IBRA bioregions or subregions? • Murray Darling Depression • Riverina • Darling Riverine Plains	Yes.	Yes.
2	Is a patch of native vegetation >10 ha present in the Project Area.	Yes.	Yes.
3	Does the patch of native vegetation contain an area of at least 5 ha dominated by mallee?	Yes. Patch size >30 ha.	No. Patch size 2.4 ha.
4	Have at least 3 MBC bird species been recorded within 20 km of the Project Area (including observed during field survey or represented by historical records <10 years old)?	Yes. • Jacky Winter (historical). • Regent Parrot (historical). • Spotted Pardalote (historical). • White-eared Honeyeater (historical). • White-fronted Honeyeater (historical). • Yellow-plumed Honeyeater (historical).	Yes. • Jacky Winter (historical). • Regent Parrot (historical). • Spotted Pardalote (historical). • White-eared Honeyeater (historical). • White-fronted Honeyeater (historical). • Yellow-plumed Honeyeater (historical).
Assessment – Vegetation association A1 is the MBC TEC. Vegetation Association A2 is not regarded as the TEC due to patch size <5 ha.			

4.2.2. Threatened flora.

A total of ten threatened flora species were identified via the desktop assessment as potentially occurring within the Project Area. The PMST identified three species that are likely or known to occur in the project Area with the BDBSA search identifying an additional species. Both *Dodonaea subglandulifera* (Peep Hill Hop-bush) and *Phlegmatospermum eremaeum* (Spreading Cress) were identified by the BSBSA to have record since 1995 and has a spatial reliability of > 1 km and are listed in Table 15 and the location within the Search Area is displayed on Figure 4. Only *Phlegmatospermum eremaeum* (Spreading Cress) specie were assessed as possibly occurring within the Project Area as there was suitable habitat, however no recent records of the species within the Search Area. The full likelihood of occurrence assessment for all species is provided in Appendix 3.

No listed flora species were recorded during field assessment.

Table 15. Likelihood of occurrence of threatened species identified in the desktop assessment. The data source and threat levels are described in the table footer.

Scientific Name	Common Name	Conservation status		Source	Last Sighting (year)	Likelihood of Occurrence in Project Area
		EPBC Act	NPW Act			
Phlegmatospermum eremaeum	Spreading Cress		R	2	2010	**Possible**

Conservation status

EPBC Act: (*Environment Protection and Biodiversity Conservation Act 1999*). NPW Act (*National Parks and Wildlife Act 1972*). Conservation Codes: CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. ssp.: the conservation status applies at the sub-species level.

Source of Information

1. **EPBC Act Protected Matters Report (DCCEEW 2023a) – 5 km buffer applied to Project Area.**
2. **BDBSA data extract (DEW 2023b) - 5 km buffer applied to Project Area.**

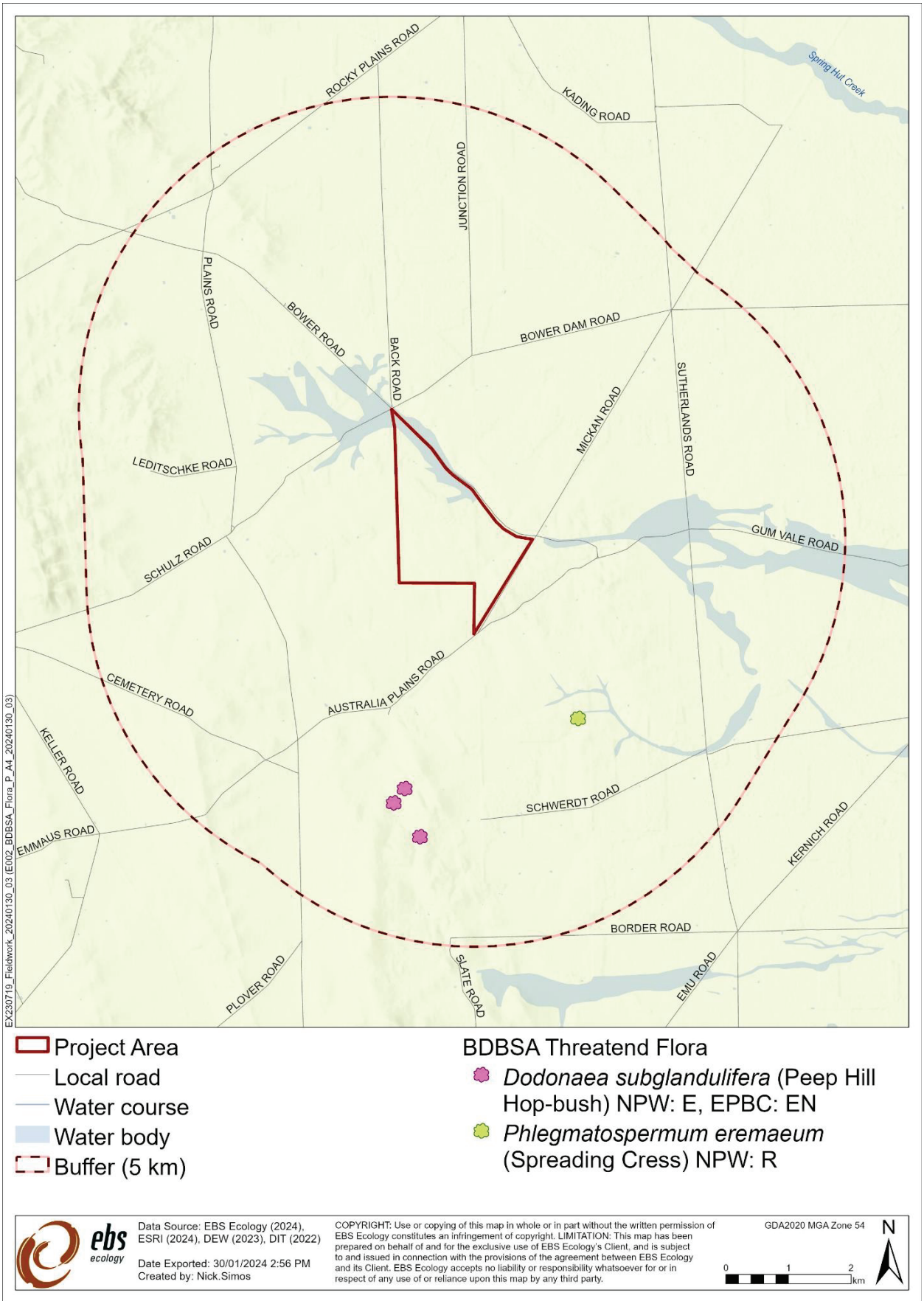


Figure 4. NPW Act and EPBC Act listed threatened flora records within 5 km of the Project Area since 1995 (< 1 km reliability) (DEW 2023b).

4.2.3. Threatened fauna.

Twenty-six (26) fauna species (24 birds and two mammals) were recorded during the field assessment. They are listed in Appendix 2. No introduced fauna species were recorded during the field assessment. The field survey recorded 1 threatened fauna species, listed as Rare under the NPW Act; White-winged Chough (*Corcorax coronoides coronoides*). Five individuals were found in the patch of mallee located in the north-eastern side of the Project Area; however, this patch of mallee is not planned on being impacted.

The desktop assessment identified three threatened fauna species have been recorded in the BDBSA within 5 km of the Project Area since 1995 with a < 1 km reliability (Table 16 and Figure 5). An additional eight threatened fauna species listed under the EPBC Act were identified by the PMST as 'known to occur' or 'likely to occur'.

The likelihood of occurrence assessment found the of these 11 species, five species are possible, likely or highly likely to occur in the Project Area and these are listed in Table 16. The full result of the database search, including species identified by the PMST as may occur and migratory species, is provided in Appendix 3 also provides the full likelihood of occurrence assessments.

Table 16. Likelihood of occurrence of threatened species identified in the desktop assessment. The data source and threat levels are described in the table footer.

Scientific Name	Common Name	Conservation status		Data Source	Date of last record / PMST	Likelihood of Occurrence in Project Area
		EPBC Act	NPW Act			
AVES						
Aphelocephala leucopsis leucopsis	Southern Whiteface	VU		1	Known	Highly likely
Corcorax melanorhamphos	White-winged Chough		R	2, 3	2020	Known
Melanodryas cucullata cucullata	South-eastern Hooded Robin	EN	R	1,2	Known, 2010	Likely
Microeca fascinans fascinans	Jacky Winter		R	2	2010	Likely
Neophema chrysostoma	Blue-winged Parrot	VU	V	1	Likely	Possible

Conservation status

EPBC Act: (*Environment Protection and Biodiversity Conservation Act 1999*). NPW Act (*National Parks and Wildlife Act 1972*). Conservation Codes: CE: Critically Endangered. EN/E: Endangered. VU/V: Vulnerable. R: Rare. ssp.: the conservation status applies at the sub-species level. Mi: listed as migratory under the EPBC Act. Ma: listed as marine under the EPBC Act.

Source of Information

1. **EPBC Act Protected Matters Report (DCCEEW 2023a) – 5 km buffer applied to Project Area.**
2. **BDBSA data extract (DEW 2023b) - 5 km buffer applied to Project Area.**
3. **Recorded during the field survey**.

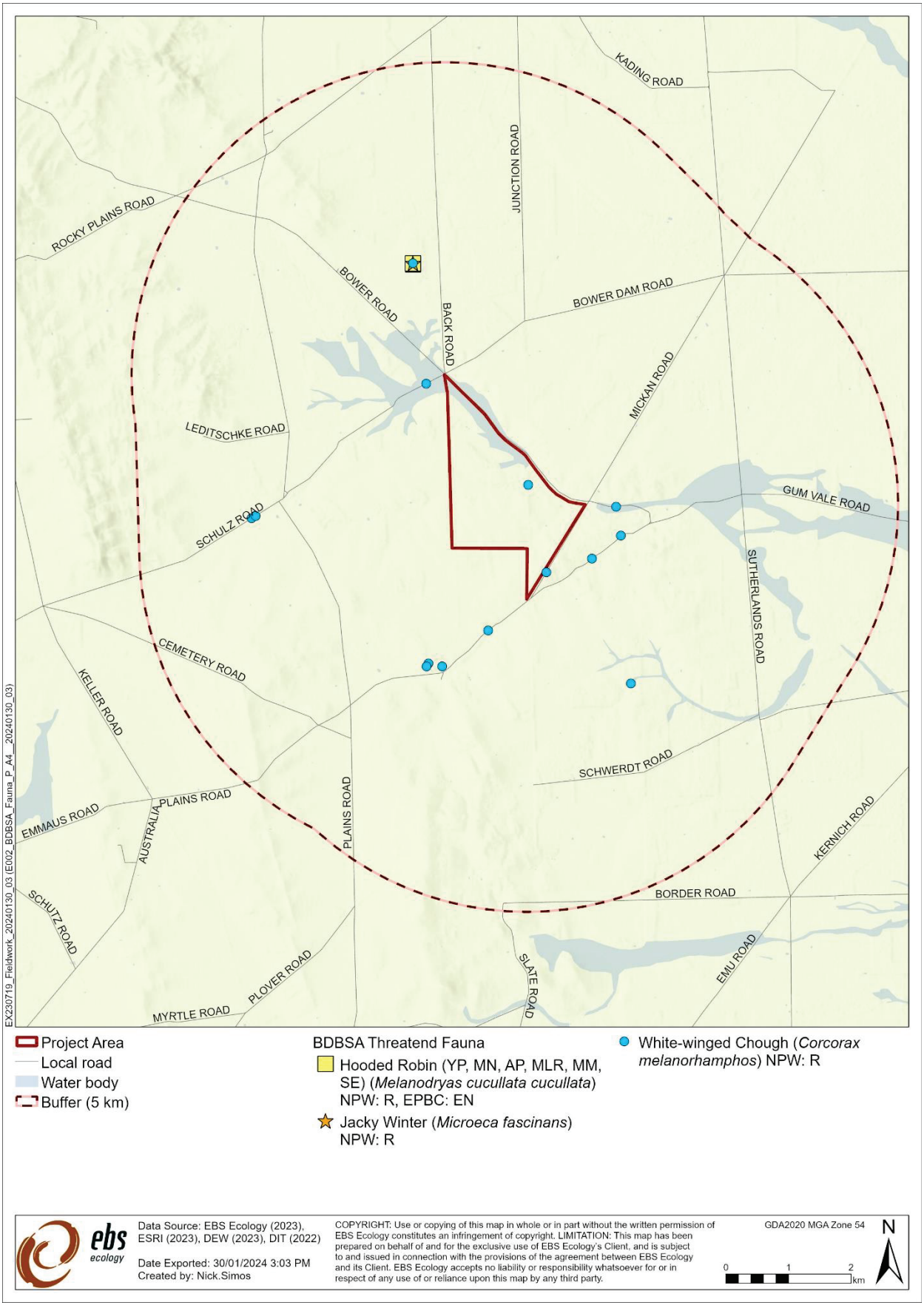


Figure 5. NPW Act and EPBC Act listed threatened fauna records within 5 km of the Project Area since 1995 (< 1 km reliability) (DEW 2023b).

4.2.4. EPBC Act listed species habitat.

Although not detected during field surveys, two EPBC Act listed fauna species are highly likely to occur in or near the Project Area:

- Hooded Robin (*Melanodryas cucullata cucullata*).
- Southern Whiteface (*Aphelocephala leucopsis leucopsis*).

Both species are likely to occur where taller shrubs, low trees and standing dead timber is present. This habitat includes mallee and open woodland areas including the following vegetation associations:

- **VA1:** *Eucalyptus oleosa ssp. oleosa* (Red Mallee) Mallee over *Maireana brevifolia* (Short-leaf Bluebush).
- **VA2:** *Eucalyptus oleosa ssp. oleosa* (Red Mallee) Open Mallee with very open understorey.
- **VA4:** *Callitris gracilis* (Southern Cyress Pine) Low Woodland over mixed shrublands.
- **VA6:** *Eucalyptus porosa* (Mallee Box) Open Mallee over *Maireana brevifolia* (Short-leaf Bluebush) / *Enchylaena tomentosa* (Ruby Saltbush).

The Project has been designed to avoid clearance of large patches of woodland and mallee. Impact to suitable habitat for the above species has been minimized and is limited to small, isolated patches. It is unlikely that, if present, these species would be significantly impacted, since impacted patches of habitat are too small to contribute to the long-term survival of either species.

4.3. Cumulative impacts

When exercising a power or making a decision under Division 5 of the Native Vegetation Regulations 2017, the NVC must consider the potential cumulative impact, both direct and indirect, that is reasonably likely to result from a proposed clearance activity.

Direct clearance of native vegetation associated with the Project includes:

- Clearance directly required for the substation;
- Clearance for the solar panel arrays;
- Clearance required for construction access; and
- Clearance for cable trenching.

The impact footprint does not account for clearance of unformed tracks which may be made within the Project Area during construction for access to installation sites, nor does it account for infrequent vehicular access along solar PV array gaps for irregular maintenance activities or annual cleaning.

Indirect impacts to native vegetation and fauna may include:

- Potential increase in dust deposition from clearance associated with solar panel installation (at least until understory vegetation regenerates).
- Impacts to retained vegetation from effects of altered hydrology, sunlight, and heat radiation from infrastructure.
- Disturbance to nesting fauna species, particularly during construction.
- Reduction in or deterrent of access to ephemeral water resources for local birds following rainfall events (including dams).

4.4. Addressing the Mitigation Hierarchy

When exercising a power or making a decision under Division 5 of the Native Vegetation Regulations 2017, the NVC must have regard to the mitigation hierarchy. The NVC will also consider, with the aim to minimize, impacts on biological diversity, soil, water and other natural resources, threatened species or ecological communities under the EPBC Act or listed species under the NPW Act.

a) ***Avoidance – outline measures taken to avoid clearance of native vegetation.***

Concept Footprint – During the initial Concept Footprint (provided in 2020) ecologists were engaged to determine the vegetations associations across the Project Area. Large areas identified as woodland and mallee were then avoided by subsequent project design phases (EBS 2021).

The Project design also avoids large patches of suitable habitat for EPBC listed species Hooded Robin and Southern Whiteface.

b) Minimization – if clearance cannot be avoided, outline measures taken to minimize the extent, duration, and intensity of impacts of the clearance on biodiversity to the fullest possible extent (whether the impact is direct, indirect or cumulative).

Wherever possible, clearance areas have been placed in areas of more disturbed vegetation, or vegetation in poorest condition, with the proposed solar panel array micro-sited to avoid these ecological constraints. The vegetation association most impacted is A3, which contains more open chenopod shrubland which has been subjected to higher grazing pressures.

The construction contractor is responsible for ensuring that the construction process meets Australia Plain Solar's standards in relation to minimising environmental harm, protecting areas of cultural heritage significance, and obtaining all required approvals or licences. This includes the development and implementation of a Construction Environmental Management Plan (CEMP) that defines management strategies designed to minimise impact to flora and fauna. This CEMP may include actions such as those listed in Table 17.

.

Table 17. Management actions that may be defined in the CEMP.

Management Plan	Management Strategy	Responsibility
Construction Environmental Management Plan	All construction personnel will be inducted to be made aware of the Vegetation Management Plan and its content.	Construction contractor
	Vegetation clearance areas will be clearly defined and marked.	
	No clearing, parking, laydown, stockpiles, or other disturbance of native vegetation outside of the defined clearance area.	
	Trigger points and stop work procedures will be developed and implemented in the event of unplanned and unauthorised vegetation clearance.	
	Vegetation clearance procedures will be clearly defined and approved by the proponent.	
	Clearance and construction activities to occur during daylight hours only.	
	Limit entry/exit points to the construction footprint to the minimum number possible.	
	All fill materials required for construction (e.g., sand, soil, gravel) will be sourced from certified weed and phytophthora free sites.	
	Restrict all vehicle and machinery traffic to designated roads and access tracks that are approved by the proponent.	
	Restrict the movement of weed material to the vegetation clearance area, including by developing and implementing machinery wash-down protocols.	

c) Rehabilitation or restoration – outline measures taken to rehabilitate ecosystems that have been degraded, and to restore ecosystems that have been degraded, or destroyed by the impact of clearance that cannot be avoided or further minimized, such as allowing for the re-establishment of the vegetation.

Rehabilitation and restoration of vegetation will be permitted in the solar array following the initial construction impact, including regeneration of low grasses and shrubs under the installed solar panels and in alternate 'gap' corridors initially used for access. Rehabilitation of native vegetation is preferable for solar farm projects to reduce dust accumulation on panels and associated maintenance.

d) Offset – any adverse impact on native vegetation that cannot be avoided or further minimized should be offset by the achievement of a significant environmental benefit that outweighs that impact.

Any adverse impact on native vegetation or ecosystems that cannot be avoided or minimised will be offset by implementing an SEB that outweighs that impact. The applicant will mitigate in the form of a payment to the Native Vegetation Fund.

4.5. Principles of Clearance (Schedule 1, *Native Vegetation Act 1991*)

The Native Vegetation Council will consider Principles 1(b), 1(c) and 1(d) when assigning a level of Risk under Regulation 16 of the Native Vegetation Regulations. The Native Vegetation Council will consider all the Principles of clearance of the Act as relevant, when considering an application referred under the Planning, Development and Infrastructure Act 2016.

The clearance is assessed against the Principles of Clearance as set out in Table 18.

Table 18. Assessment against the Principles of Clearance.

Principle of clearance	Considerations
Principle 1(a) – it comprises a high level of diversity of plant species	**Relevant information** The Project Area was comprised of 60 flora species consisting of 44 native species and 14 weed species, with some areas being highly degraded though agriculture, grazing and planation (VA3 and VA5). Patches; Bushland Plant Diversity Scores – **A1:** 15.4 **A2:** 12 **A3:** 21.14 **A4:** 26 **A5:** 20 **A6:** 26 **A7:** 12 **A8:** 19.3
	Assessment against the principles At Variance: A1, A2, A3, A4, A5, A6, A7, A8 (Plant Diversity Score = 10-20). Seriously at Variance: No vegetation associations.
	Moderating factors that may be considered by the NVC. The Project Area is surrounded by native vegetation, with the NatureMaps SA Native Vegetation layer showing 13% native vegetation coverage within 5 km of the site (DEW 2023a). 180.23 ha of clearance represents 17.65% of an approximate 1,021.02 ha of vegetation within a 5 km radius and therefore this moderating factor may apply.
Principle 1(b) – significance as a habitat for wildlife	**Relevant information** One State threatened species was detected during the field survey: • White-winged Chough (*Corcorax melanorhamphos*) - NPW Act: Rare. Based on proximity of and time since the most recent record and the type of habitats available within the Project Area, other threatened species which may utilise the Project Area include: **Highly likely** • Hooded Robin (*Melanodryas cucullata cucullata*) - EPBC Act: Endangered and NPW Act: Rare. **Likely** • Jacky Winter (*Microeca fascinans spp.*) - NPW Act: Rare. • Southern Whiteface (*Aphelocephala leucopsis leucopsis*) – EPBC Act: Vulnerable. **Possible** • Blue-winged Parrot (*Neophema chrysostoma*): EPBC Act: Vulnerable and NPW Act: Vulnerable; The Southern Whiteface (EPBC rating – Vulnerable) has not been recorded in the Project Area as of 1995, however is considered highly likely to occur in the Project Area. One nationally listed species, being the Hooded Robin, has been recorded within the Search Area and is considered highly likely to occur. The Jacky Winter, which is a State listed rare species, has also been recorded within the Search Area and assessed as highly likely to occur in the Project Area. Two other species are considered to possibly occurring in the Project Area. All nationally listed species known or considered likely to occur are discussed in Section 4.2.4, however, briefly: **Southern Whiteface** The Southern Whiteface are widespread across the southern half of mainland Australia, where they occupy open woodlands and shrublands with grassy understorey. The species forages in the understorey of low tree density habitats, and use low bushes, small hollows, or crevices to nest. Southern Whiteface have recently been listed as nationally Vulnerable under the EPBC Act due to a substantial decline in their population (30-50%) over the last 10 years. No records of Southern Whiteface occur within 5 km of the Project Area since 1995, however the PMST identified the species to be known to occur in the area and the suitable habitat is present within the Project Area. An EPBC self-assessment is likely to be required to determine the significance of impact for this species.

Principle of clearance	Considerations

South-eastern Hooded Robin

The subspecies of Hooded Robins occurs in the south-eastern area of Australia, where there are estimated to be 100 subpopulations. They utilise dry eucalypt and acacia woodland and shrublands with an open understorey of grasses and herbs. The species has recently been listed as nationally Endangered under the EPBC Act (effective 31st March 2023) due to a significant (>50%) population decline over the last 10 years. Critical habitat for the species includes areas which contain their known preferred habitat. There are multiple records of Hooded Robin within 5 km of the Project Area. An EPBC self-assessment may be required to determine the significance of impact for this species.

NPW Act listed species assessed as likely or known in the Project Area are discussed below.

White-winged Chough

The White-winged Chough occurs southern areas of SA and throughout most of eastern and south-eastern Australia. They are most a sedentary and colonial species that inhabits woodlands and taller mallee, where it feeds on the ground amongst the leaf-litter. Tend to prefer wetter areas with leaf-litter, for feeding, and available mud for nest building. The species has been thought to be declining, as the occupancy of the species has become very restricted (SA museum 2005). An EPBC self-assessment may be required to determine the significance of impact for this species as the species were observed.

Jacky Winter

The Jacky Winter prefer open woodland (Eucalypt and mallee) with an open shrub layer and bare ground, but also often seen in farmland and parks. The has a wide distribution across Australia but the subspecies that occurs in the area has been listed as Rare under the NPW Act due to the species occupancy being restricted (DEH 2014). The Project Area is located on the boarder where the NPW listed subspecies and a non NPW listed subspecies occur. As there are multiple recent records of the Jacky Winter within 5 km of the Project Area, an EPBC self-assessment may be required to determine the significance of impact for this species.

More generally, vegetation within the site contains suitable habitat for a wide range of species and contains habitat features which support sheltering (trees, shrubs, woody debris), nesting (structurally diverse vegetation), and foraging (seeds, fruits, seasonal nectar). It is likely to support a range of common and less common species.

A total of 26 native fauna species were recorded within the Project Area during the field survey which occurred over one day.

There are still patches of vegetation in the Project Area which has not been largely cleared which some are connected to other patches in the surrounding area by native corridors, however other patches of native vegetation have formed islands as a majority of the Project Area was once cleared for cropping. Damp drainage depressions, a man-made dam and drainage lines are unlikely to hold water during times of drought, and therefore do not contribute significantly as a refuge for fauna.

VA	Threatened Fauna Score	UBS
A1	0.1	72.44
A2	0.1	31.77
A3	0.1	32.86
A4	0.1	61.31
A5	0.1	57.11
A6	0.1	75.47
A7	0.1	47.07
A8	0.1	42.51