REFERRAL OF A PROJECT FOR A DECISION ON THE NEED FOR ASSESSMENT UNDER THE *ENVIRONMENT EFFECTS ACT 1978*

REFERRAL FORM

The *Environment Effects Act 1978* provides that where proposed works may have a significant effect on the environment, either a proponent or a decision-maker may refer these works (or project) to the Minister for Planning for advice as to whether an Environment Effects Statement (EES) is required.

This Referral Form is designed to assist in the provision of relevant information in accordance with the *Ministerial Guidelines for assessment of environmental effects under the Environment Effects Act 1978* (Seventh Edition, 2006). Where a decision-maker is referring a project, they should complete a Referral Form to the best of their ability, recognising that further information may need to be obtained from the proponent.

It will generally be useful for a proponent to discuss the preparation of a Referral with the Department of Planning and Community Development (DPCD) before submitting the Referral.

If a proponent believes that effective measures to address environmental risks are available, sufficient information could be provided in the Referral to substantiate this view. In contrast, if a proponent considers that further detailed environmental studies will be needed as part of project investigations, a more general description of potential effects and possible mitigation measures in the Referral may suffice.

<u>In completing a Referral Form, the following should occur:</u>

- Mark relevant boxes by changing the font colour of the 'cross' to black and provide additional information and explanation where requested.
- As a minimum, a brief response should be provided for each item in the Referral Form, with a more detailed response provided where the item is of particular relevance. Cross-references to sections or pages in supporting documents should also be provided. Information need only be provided once in the Referral Form, although relevant cross-referencing should be included.
- Responses should honestly reflect the potential for adverse environmental effects. A Referral will only be accepted for processing once DPCD is satisfied that it has been completed appropriately.
- Potentially significant effects should be described in sufficient detail for a reasonable conclusion to be drawn on whether the project could pose a significant risk to environmental assets. Responses should include:
  - a brief description of potential changes or risks to environmental assets resulting from the project;
  - available information on the likelihood and significance of such changes;
  - the sources and accuracy of this information, and associated uncertainties.
- Any attachments, maps and supporting reports should be provided in a secure folder with the Referral Form.

- A CD or DVD copy of all documents will be needed, especially if the size of electronic documents may cause email difficulties. **Individual documents should not exceed 2MB.**
- A completed form would normally be between 15 and 30 pages in length. Responses should not be constrained by the size of the text boxes provided. Text boxes should be extended to allow for an appropriate level of detail.
- The form should be completed in MS Word and not handwritten.

The party referring a project should submit a covering letter to the Minister for Planning together with a completed Referral Form, attaching supporting reports and other information that may be relevant. This should be sent to:

Postal address

Minister for Planning
PO Box 500
EAST MELBOURNE VIC 3002

Couriers

Minister for Planning
Level 17, 8 Nicholson Street
EAST MELBOURNE VIC 3002

In addition to the submission of the hardcopy to the Minister, separate submission of an electronic copy of the Referral via email to ees.referrals@dpcd.vic.gov.au is encouraged. This will assist the timely processing of a referral.

PART 1 PROPONENT DETAILS, PROJECT DESCRIPTION & LOCATION

1. Information on proponent and person making Referral

Name of Proponent:	**Solar Systems Pty. Ltd.**
Authorised person for proponent:	Ben Barnett
Position:	Manager - Project Development
Postal address:	45 Grosvenor Street Abbotsford VIC 3067
Email address:	ben.barnett@solarsystems.com.au
Phone number:	9413 8000
Facsimile number:	9413 8500
Person who prepared Referral:	Shane Melotte
Position:	Environment and Planning Co-ordinator
Organisation:	Solar Systems
Postal address:	45 Grosvenor Street Abbotsford
Email address:	shane.melotte@solarsystems.com.au
Phone number:	9413 8000
Facsimile number:	9413 8500
Available industry & environmental expertise: (areas of 'in-house' expertise & consultancy firms engaged for project)	**Solar Systems** - Environmental and Planning - Community Consultation - Project Management - Solar Power Station Design and Construction - Reflectivity and UV management - Electromagnetic Interference Management - Fire Management Key Personal: Ben Barnett Damien Heintze Maria Zombos Shane Melotte **<u>Preliminary Due Diligence of North West Region</u>** **Parsons Brinkerhoff Australia Pty. Ltd** - Ecology (Flora and Fauna) - Geotech, surface water and ground water

	Archaeological Consulting Services - Cultural Heritage Key Personnel: Vanessa Edmonds **Hydro Tasmania Pty. Ltd.** - Power Network and Connections investigation **SJB Planning Pty. Ltd.** - Planning services Key Personnel: Peter Doyle **Provincial Matters Pty. Ltd.** - Planning services Key Personnel: Fiona Costall **<u>Detailed Site Investigations</u>** **Biosis Pty Ltd** - Ecology (Flora and Fauna) Key Personnel: John Miller, Katrina Sofos, Deborah Peeters **Sinclair Knight Mertz Pty. Ltd.** - Cultural Heritage (indigenous and non indigenous) Key Personnel: Vanessa Edmonds, Jeff Hill **Environmental Resources Management Australia Pty. Ltd** - Visual Impact Assessment - Landscape mitigation measures Key Personal: Allan Wyatt, Hayden Brurge, Madhu Lakshmanan **Orbit Solutions Pty. Ltd** - Computer Generated Imagery and aligned views Key Personnel: Jennifer Smith, Chris Goss **Geotechnical Testing Services Pty. Ltd** - Geotech testing and assessment Key Personnel: Shane Hampton **Parsons Brinkerhoff Australia Pty. Ltd** - Geotechnical Peer review of GTS report Key Personnel: Allan Garrard

	Cardno Grogan Richards (Cardno Victoria Pty. Ltd) - Traffic engineering assessment and traffic impact assessment Key Personnel: Stephen Hunt **Essential Economics Pty Ltd** - Economic Impact assessment Key Personnel: Dennis Ingerman, John Henshall and Austin Miller **Collaborations Planning with your Community Pty Ltd** - Social impact assessment - Community Consultation Advisors Key Personnel: Michelle Howard **David Rosendale** - Photography **SJB Planning Pty. Ltd.** - Planning services Key Personnel: Peter Doyle **Provincial Matters Pty. Ltd.** - Planning services Key Personnel: Fiona Costall

2. Project – brief outline

Project title:
Solar Systems North West Victoria Solar Energy Facility: 154MW Solar Power Station Solar Systems in partnership with TRU Energy propose to construct a 154MW large scale solar power station (Solar Energy Facility) in the North West Victorian Sunraysia Mallee region.
Project location: (describe location with AMG coordinates and attach A4/A3 map(s) showing project site or investigation area, as well as its regional and local context).

Solar Systems has identified three (3) sites that are deemed potentially suitable for the proposed development. These are referred to as the Thurla Site (Site A), the Yatpool South Site (Site B) and the Carwarp Site (Site D). The **Carwarp Site (Site D)** is included in this referral.

It is noted that the project will ultimately be located on one (1) site only*. Once the final site is selected Solar Systems will seek planning permission for that particular site.*

The Region

The subject site is situated approximately 15 kilometres south and south west of Red Cliffs, a small rural town located approximately 17 kilometres south of Mildura and within the municipal boundaries of the Rural City of Mildura. The Municipality is located in the north west of Victoria and covers approximately 10 per cent of the area of the State.

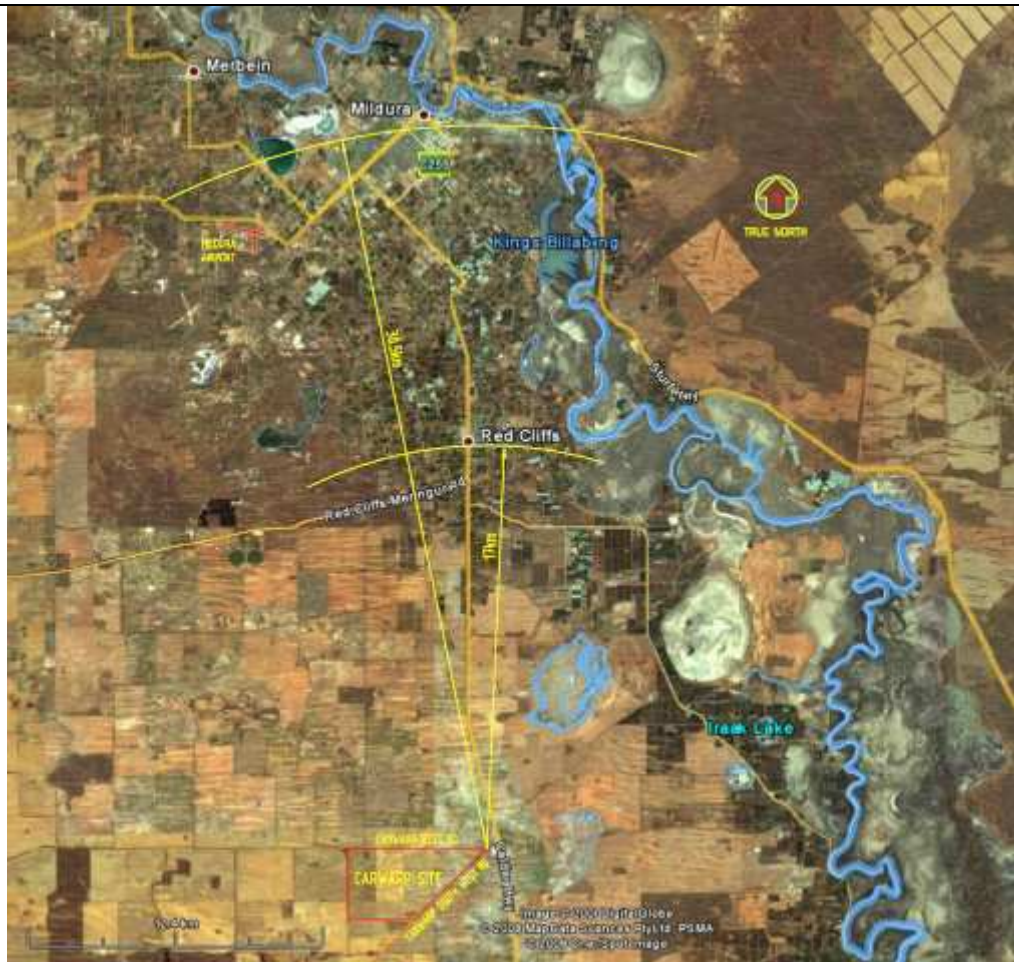
The Rural City of Mildura has a population of approximately 60 000 people with tourism, grain farming and intensive horticulture forming the basis of the economy. The Murray River forms the northern boundary of the Municipality and is a key environmental asset in the region. The river, along with protected areas such as Hattah-Kulkyne National Park and Murray Sunset National Park contribute to the municipality's unique natural landscape. The region has a temperate climate throughout the year which supports the vineyards, citrus groves, irrigated fields and dryland farms vital to the horticultural and agricultural economy and the tourism industry. Major commodities exported from the region include dried fruits, olives, grains, vegetables, citrus, table grapes and wine.

The Calder Highway provides the main transport route connecting the Mildura region with the rest of Victoria. With an approximate population of 2500, the town of Red Cliffs provides a range of local services including two supermarkets, a number of banks, newsagencies, convenience food and general retail.

Carwarp Site (Site D)

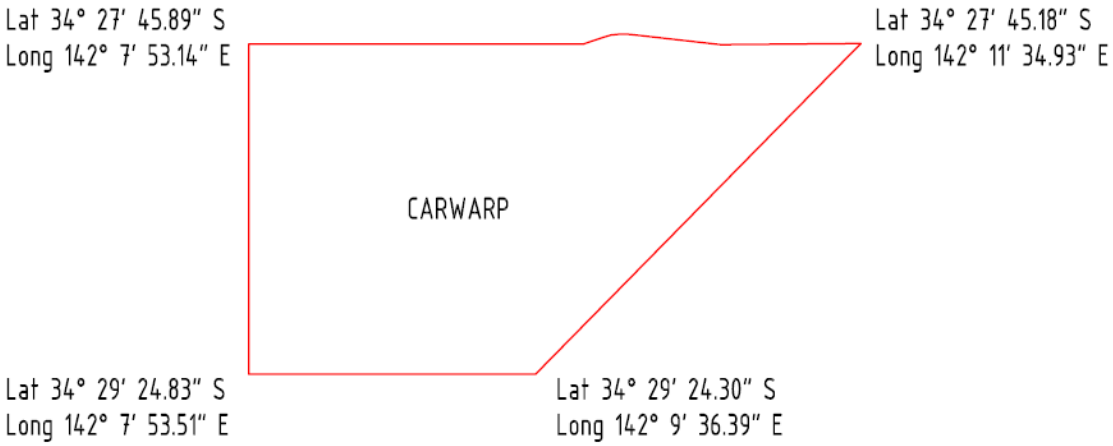
The Carwarp Site (Site D) is located immediately to the west of the Carwarp Township, which is approximately 15 kilometres south of Red Cliffs along the Calder Highway. Carwarp is a small settlement of around 11 homes adjacent to the railway, with surrounding outlying farming properties.

The site is approximately 1200 hectares in area and is comprised of four (4) allotments, Allot. 25, 26, 27 and 56 Parish of Carwarp West and is located approximately 600 metres west of the Calder Highway and rail line along Carwarp West Road.



A full site locality plan is located at Annex 1
A site analysis plan is located at Annex 2

The co-ordinates for the site area as follows:



Short project description (few sentences)**:**

Solar Systems Pty Ltd (in partnership with TRU Energy as the facility owner and operator) proposes to develop a 154 Megawatt Solar Energy Facility in North

West Victoria. The project investment totals $420Million (including $75 Million Australian Government and $40 Million Victorian Government grant funding).

Solar Systems technology works by concentrating solar energy with mirrors onto high efficiency photovoltaic (PV) cells that convert it directly into electricity. The electricity generated is passed through an inverter and connected to the national electricity grid.

The facility will comprise the following major components: Solar dishes, heliostats and receivers, management hubs, cooling systems, inverter rooms and substations.

The Solar Energy Facility will generate 270,000 Megawatt hours per annum, which is enough to supply electricity to approximately 45,000 homes annually and resulting in a reduction of approximately 400,000 tonnes of greenhouse gas emissions each year.

The project is proposed to be located on approximately 1000 - 1200 hectares of freehold non-irrigated farmland and requires minimal water use. The main infrastructure of the proposed Solar Energy Facility has a foot print of approximately 600 hectares (pending on final design and technology composition). Solar Systems has entered into agreements with the respective landowners to secure the land for the proposed project.

The site selection process has involved detailed regional and site specific field investigations by Solar Systems and a range of specialist consultants, which assessed the site suitability based on environmental, cultural, physical and socio-economic impacts and opportunities.

A concept plan for the project on each respective site is annexed at attachment 3.

3. Project description

Aim/objectives of the project (what is its purpose / intended to achieve?):
The aim of this project, assisted by State and Federal funding, is to develop and deploy Solar Systems world leading solar technology on a large scale demonstrating its efficiency and cost effectiveness in a utility application. The project aims to significantly advance Victoria's and Australia's standing in the renewable energy sector and support the Victorian Government's Renewable Energy Target, which aims to ensure at least 10% of Victoria's electricity consumption comes from renewable energy sources by 2016 and the Federal Governments Commitment of ensuring that 20 per cent of Australia's electricity supply comes from renewable energy sources by 2020. The exposure draft legislation on the design of the Renewable Energy Target scheme has been released for public comment.

The success of this project is expected to result in the development of many similar large scale solar power stations across the nation, creating a new industry with potential for significant investment and employment generation. There has also been very strong interest in Solar System's technology from the international energy sector.

Background/rationale of project (describe the context / basis for the proposal, eg. for siting):

In November 2006 Solar Systems was awarded $130M in Commonwealth and Victorian Government funding for a $420M, 154MW project in north-west Victoria. When complete, the project is expected to be the largest and most efficient solar power station of its kind, in the world.

Solar System's initially looked to the north west of Victoria for a project site because of its unmatched solar resource within the State and its proximity to existing urban areas and major industry.

An exhaustive and detailed site selection process was undertaken to evaluate a range of possible project sites in this region. This process sought to identify and assess likely impacts of the project and determine the potential risks for approvals and siting of the project.

This process comprised three major elements.

1. Site Selection Criteria – Identify key site selection criteria and key components of each.
2. Initial Screening of potential sites for Solar, Land Suitability and Network Capacity – completed through the assessment of solar resource data, elimination of unsuitable land and examination of power (transmission) network maps. Three main regions in north west Victoria were identified. The graphic composite overlay process was then used to identify potentially suitable areas within each region. Validation of these "Areas of Interest" was achieved via visual inspection of potential sites.
3. Evaluate Regions and Sites against factors impacting site suitability – Areas of Interest and individual "candidate" sites within each area were assessed in order to identify a preferred region for the project and a preferred site for ultimate project development.

The key site selection criteria used to evaluate the potential project sites in north west Victoria are listed below.

- Solar Resource
- Regional Network Capability and Profile
- Network Connection Costs and Benefits
- Environmental Parameters (e.g. biodiversity, cultural heritage)

- Physical Site Conditions
- Water Availability and Access
- Proximity to Resources
- Current and Future Neighbours (proximity and type)
- Stakeholder Requirements
- Planning Approvals Pathway / Process

Site Screening and Evaluation Process – Three (3) Key Steps

To provide a mechanism for ranking and prioritising potential project sites in north west Victoria, a site-screening process was developed to evaluate relatively large areas. The process is intended for use in siting large scale, commercial, grid connected, solar energy facilities.

Step 1 – Initial Screening of Solar Resource

Step 2 – Initial Screening for Land Suitability and Power Network Capability

Step 3 – Evaluate Factors Affecting Site Suitability

The screening process was developed based on commonly used techniques and adjusted for application in regional Victoria.

The result of this work is a five-step process that addresses solar resource evaluation, evaluation of land suitability and power network capacity, analysis of definitive or specific local area suitability, preliminary regional and site ranking, and quantitative analysis.

Solar Systems commissioned a number of preliminary due diligence investigations by independent specialist consultants to inform several of the above considerations. These included investigations into the following areas:

- Biodiversity (Parsons Brinkerhoff)
- Cultural Heritage (Vanessa Edmonds)
- Geotechnical, Surface water and Ground Water (Parsons Brinkerhoff)
- Planning and Environment Policy (SJB and Provincial Matters)
- Power connection options and network capacity (Hydro Tasmania)

The outcomes of this process concluded that three sites located in the Red Cliffs area to the south of Mildura were the most suitable location for the project. The main driving factors behind this final decision were the power network limitations at Swan Hill and Kerang and the environmental constraints (proximity to Ramsar Wetland at Kerang). The three sites are identified as Site A, Site B and Site D shown in the Map at Figure 3 below.

Following this outcome, Solar Systems commissioned further detailed site assessments for each of the three sites by specialist consultants in the following areas:

- Biodiversity (Biosis)
- Cultural Heritage (SKM)
- Project visualisation and Visual Impact assessment (Orbit and ERM)
- Social Impact and Economic Impact assessment (Collaborations and Essential Economics)
- Traffic Impact Assessment (Cardno Grogan Richards)
- Geotechnical profile (Geotechnical Testing Services and Parsons Brinkerhoff)

The relevant consultant reports from this process are attached at annexes 9 to 14.

In summary there were no project prohibitive constraints identified on any of the sites through the detailed site analysis, the sites were found to be:

- located in an area of high solar resource.
- proximate to necessary power network infrastructure, sizable townships, a major highway and a commercial rail line.
- highly modified sites which are predominantly cleared of native vegetation with generally low biodiversity senstivities.
- contain no or low cultural heritage significance.
- significantly distanced from highly sensitive natural ecosystems.
- set within an area of extremely low population density with no neighbour closer than 500 metres and limited potential for visual impacts on neighbours.
- accessible to main utility services.
- have limited or only partial visibility from the nearest main road or highway.

In addition to completing site selection due diligence, Solar Systems has continued to engage both State and Federal Government at a high level to confirm ongoing awareness and support for the site selection and approvals process being undertaken. These discussions have all been very positive and supportive to date.

Main components of the project (nature, siting & approx. dimensions; attach A4/A3 plan(s) of site layout if available):

Solar Systems power stations have four essential components:

• **Concentration System** – mirrors that focus sunlight onto Photovoltaic (PV) 'receivers'
• **Receiver** – contains high efficiency PV cells integrated into Solar Systems groups of PV cells (called 'modules'), which are then assembled into the 'receiver'.
• **Cooling System** – the operating temperature of the PV cells is maintained by a non-evaporative,
water-based cooling system
• **Internal Network and Control System** – an internal network connects each power producing unit within a power station together to enable the power to be fed collectively back to the grid and be connected back to a control system that

maximises power output by ensuring the mirrors accurately track the sun throughout the day.

Concentration System

Solar systems has two (2) solar concentration systems, The Solar Dish (CS500) and the Heliostat Concentrator Photovoltaic (HCPV). These are described below.

The Solar Dish (CS500)

The solar dish looks similar in appearance to a satellite dish. It has a diameter of 14 metres and 112 curved mirrors that form the dish shape. Each mirror is approximately 1.1 m^2. The total height of the dish is approximately 15 metres from ground level (tip of dish at solar noon). This shape allows a sunlight concentration of up to 500 times onto a PV cell receiver mounted about nine metres in front of the dish. The PV cell receiver converts the light directly into electricity. Control and drive systems enable the dish to track the sun throughout the day and continually maximise power. A solar dish requires the construction of a cement foundation with a depth of approximately 6 metres but this varies depending soil profiles.

The solar dish is currently at its 5th model of evolution and it requires approximately 27 dishes to develop a 1 Megawatt power station.

There are five existing solar dish power stations currently operated by Solar Systems in central Australia and Queensland.

Solar Systems power station in remote central Australia

A diagram of typical Dish field is attached at Annex 4.

Heliostat Concentrator Photovoltaic (HCPV)

The HCPV is an emerging Solar Systems technology designed to drive down the cost curve of power production. HCPV is currently installed and undergoing optimisation at the Solar Systems Bridgewater Research and Development facility located about 2 Km outside of Bridgewater in the Shire of Loddon.

HCPV technology consists of heliostats, or sun tracking mirrors, arranged in a field and concentrate sunlight onto a larger version of the Solar dish PV receiver but in this format the receiver is mounted at the top of a static tower. One tower with associated heliostats is expected to produce between 140 kW and 1MW of power and is referred to as a “repeatable unit” i.e. Ten (10) 1 MW HCPV repeatable units are required to create a 10MW HCPV power station or seventy one (71) repeatable units of 140kW are required.

The height of the tower and number of heliostats form a respective “repeatable unit’’ and are proportional to the power output of the unit – the heliostats will range between 30 and 150 in number, and tower height between 20 and 50 metres. The 140kW HCPV test bed at Bridgewater has 32 heliostats. Each heliostat has a height of approximately 6 metres, a width of approximately 4.5 metres and comprises 16 mirrors. It also has a receiver tower with a height of approximately 35 metres.

As this is emerging technology, the detailed design of the heliostats and towers will evolve and be refined prior to the commencement of construction but will be within these parameters.

Each heliostat and tower require the construction of concrete foundations with a depth of up to 2 metres for heliostats, 2 metres for dishes and 8 metres for receiver towers.

Heliostat Fields at Solar Systems Bridgewater Test Facility

A diagram of typical HCPV field is attached at Annex 5.

Receivers

A receiver contains high efficiency PV cells integrated into Solar Systems' groups of PV cells (called 'modules'), which are then assembled into the 'receiver'. The receiver is the focal point of the concentrating mirrors and the PV cells within the receiver convert the concentrated light directly into electricity. The receiver is also connected to the non-evaporative cooling systems via pipe work to dissipate the low grade heat component of the concentrated light.

Cooling system

The non-evaporative cooling system developed by Solar Systems will maintain the optimal operational temperature of the PV receiver. It is a closed loop system which circulates water through the receiver and does not actively consume water, much like car radiator. Each solar dish and HCPV repeatable unit will have a number of cooling systems proportional to the power output.

Internal Network and Control System

All of the components of the power station are linked back to a central control system which monitors operation of the power station and maximises efficiency by controlling such elements as the accuracy of the sun tracking mirrors or the temperature of the Photovoltaic receivers. This is a highly sophisticated control system which has been used for the existing (dish based) power stations that use solar systems technology.

North West Vic Project

It is expected that both Solar dishes and HCPV repeatable units will be deployed for the North West Vic Project. The final composition of the power station is pending the outcomes of technology optimisation work currently being completed at the Bridgewater test facility.

Ancillary components of the project (eg. upgraded access roads, new high-pressure gas pipeline; off-site resource processing):

In addition to the above primary elements the following ancillary components of the project will be constructed:

- Mechanical and equipment storage areas ;
- Inverter and services buildings;
- On-site electrical substation;
- Management hub buildings, amenities and temp accommodation;
- Mechanical and maintenance workshops
- Water supply infrastructure;
- Waste water treatment plant and sewage treatment plant;
- Internal roadways, car park and access to local roads and Highways; Optional rail siding connection to regional railway line;

Key construction activities:

Typical construction activities will be required for the project. These are summarised as follows:

- Initial road upgrades and connection of any necessary utilities to the site. Upgrading of any access points for either site will not require the removal of vegetation.
- However the traffic assessment prepared by Cardno Grogan Richards (annex 14) has noted that intersection of Carwarp West Road and the Calder Highway may require upgrading. If upgrading is required there may be some vegetation removal along the side of the highway may be necessary. This would advantage existing large vehicles that use this access point association with grain storage and distribution.
- Earth works including site levelling and excavation for footings and internal underground cabling.
- On site cement batching and foundation construction.
- Construction of all buildings such as the control room and storage sheds.
- Technology assembly and erection of structures using cranes where necessary.
- Low voltage and High voltage electrical wiring and connection work.
- Grid connection work.
- Metal fabrication, cooling installation/plumbing activities.

Key operational activities:

The operational activities are summarised as follows:

- Power station operators monitoring the performance and output of the power station from the Central Control room.
- Maintenance and repair activities carried out in the field and the Mechanical and Maintenance Workshops.
- Low frequency delivery of new components for the maintenance and repair as require.
- An interpretation centre for visitors to learn about the project.

Key decommissioning activities (if applicable):

Solar System's technology is designed to allow upgrading and augmentation as the efficiency of Photovoltaic technology improves and options for value adding to a Solar Systems power station such as energy storage become available.

However in the unlikely event that the project is decommissioned this would involve removing the infrastructure from the site and remediation works such as earth works and planting as necessary.

Is the project an element or stage in a larger project?

☒ No ☐ Yes If yes, please describe: the overall project strategy for delivery of all stages and components; the concept design for the overall project; and the intended scheduling of the design and development of project stages).

Is the project related to any other past, current or mooted proposals in the region?

☐ No ☒ Yes If yes, please identify related proposals.

The project follows the development of the Solar Systems Bridgewater Research and Development Facility in the Shire of Loddon (the "Solar Energy Test Facility" or SEFT). This facility serves as a test bed for the optimisation of the Solar Dish and HCPV technology that will be deployed at the NW VIC site. The assessment and approval of this facility also allowed for the development of the approvals pathway that is being used for the current project however in that instance no EES referral was required.

4 Project alternatives

Brief description of key alternatives considered to date (eg. locational, scale or design alternatives. If relevant, attach A4/A3 plans):

As noted above Solar Systems investigated sites located within three major areas of interest in the North West Victorian Region. These were referred to as the Kerang, Swan Hill and Mildura Interest Areas. Solar Systems looked at options of locating both part, and the entire project on parcels of land within these three regions. Following preliminary screening and assessment Solar Systems identified 12 sites across the three regions which were explored in more detail and then narrowed down to three sites within the Mildura Region. Detailed site assessments and investigation have been carried out for each of the three sites.

The final detailed design and layout is unknown at this stage. However the Carwarp Site (Site D) considered to represent excellent options for the project and is generous in size to allow for a design and layout that responds to the respective sensitivities of the site.
A summary of the three areas of interest is provided below.

Kerang Area of Interest

Key points describing the Kerang sites are;

- Sites are located to south of Kerang township (approx 5km).
- Multiple small to medium properties of 50 – 200 ha.
- Relatively open flat farming country, proximate to terminal station.
- Sound buffer distances from neighbours and residential developments.

All sites in the Kerang area are relatively flat, with existing road frontage to either the Echuca Highway (sealed) or the Old Echuca Road (gravel). A portion of the study area occurs on an extensive floodplain plain. The current land-use of the study site is predominantly agriculture (mainly cropping and livestock grazing), with the plain having been largely cleared in the nineteenth century.

Depending on rainfall patterns each year, it is possible that surface waters in late winter/spring that differ annually in depth, extent and duration could periodically inundate parts of the study site.

Seven residential dwellings are scattered around the site. The footprint of any facility located in this region would be sited on extensively grazed and modified agricultural land.

The area is quite proximate (within 2-3km) of the Kerang Terminal Station located on the Murray Valley Highway immediately south of Kerang.

Swan Hill Area of Interest

Key points describing the Swan Hill sites are;

- Sites are located to west Swan Hill township (5 - 10 km west).
- Multiple medium properties of 100 – 300 ha.
- Relatively open gently undulating farming country, proximate to terminal station.
- Suitable distances from neighbours and residential developments.

All sites in the Swan Hill area are also gently undulating, with existing road frontage to the Swan Hill – Sea Lake Road (sealed). The current land-use of the study site is predominantly agriculture (mainly cropping and livestock grazing), with the plain having been largely cleared in the nineteenth century.

There are minimal residential dwellings scattered throughout the study area. The footprint of any facility located in this region would be sited on extensively grazed and modified agricultural land.

The area is quite proximate to the Swan Hill Sub Station located on the Swan Hill – Sea Lake Road, approximately 2km west of the existing centre.

Mildura Area of Interest

Key points describing the Mildura sites are;

- Sites are located to south of Red Cliffs (20-30km south of Mildura off Calder Highway).
- Multiple large properties of 200 – 2000 ha dominate.
- Open flat farming country, proximate to power.
- Significant distances from neighbours, horticulture, and residential developments.

The site selection process narrowed the options down to three sites within the Mildura interest areas. These are known as the Thurla Site (Site A), Yatpool

South Site (Site B) and the Carwarp Site (Site D). These sites were then investigated in further detail by specialist consultants.

Design Alternatives
The scalability of Solar Systems technology allowed the site selection process to consider locating both the entire power station and only part of the power station on the respective sites. It was ultimately determined through influencing considerations such as the availability of large sites, the power network and logistics efficiencies, that locating the entire power station on one site would be the most optimal outcome.

As the project comprises both advanced and emerging concentration systems, only indicative design and layout work has been completed at this stage. This work enabled high level verification of the respective sites capacity to design and layout flexibility without compromising any site sensitivities.

All significant stands of remnant vegetation had been set aside as project use and development exclusion zones. As such, significant areas of environmental sensitivity on the site will be protected regardless of design alternatives.

In addition to the use/development exclusion zones on the adopted project concept plan, areas of ecological significance will be protected by the requirement for the development of a project Environmental Management Plan.

Brief description of key alternatives to be further investigated (if known)**:**

There are no known alternatives to be further investigated at this stage.

5. Proposed exclusions

Statement of reasons for the proposed exclusion of any ancillary activities or further project stages from the scope of the project for assessment:

There are no project exclusions

6. Project implementation

Implementing organisation (ultimately responsible for project, i.e. not contractor)**:**

Solar Systems Pty Ltd
TRU Energy Pty Ltd

Implementation timeframe:

Project construction will take four (4) years with site establishment commencing in 2009 and project completion by end 2013. Construction will be completed in four (4) main stages as outlined below.

Proposed staging (if applicable):

Project Stages	Deliver	Expected delivery
Stage One	Site Establishment works Completed	2009
Stage Two	Optimised 2 megawatt pilot plant	2010
Stage Three	102 megawatt power station	2012
Stage Four	Complete 154 megawatt power station	2013

7. Description of proposed site or area of investigation

Has a preferred site for the project been selected?

☐ No ☒ Yes If no, please describe area for investigation.
If yes, please describe the preferred site in the next items (if practicable).

General description of preferred site, (including aspects such as topography/landform, soil types/degradation, drainage/ waterways, native/exotic vegetation cover, physical features, built structures, road frontages; attach ground-level photographs of site, as well as A4/A3 aerial/satellite image(s) and/or map(s) of site & surrounds, showing project footprint):

This referral relates to the Carwarp site. ***Only one of the three short listed sites will be selected for the project. Final site selection is expected in late March.*** Descriptions for each of these sites area provided below.

CARWARP SITE (Site D)

Physical Features

Overview of the Region

The Carwarp Site (Site D) is also highly modified as a result of long term and high intensity agricultural production on the site. The land is flat to gently undulating with calcareous gravel materials near the surface. The site has largely been cleared for farming purposes however a large stand of remnant vegetation is located adjacent to the section of the western boundary. Several other small stands and isolated trees are located throughout the site. A discontinued irrigation channel dissects the southern part of the property. There is a depression running east-west through the western half of the site. No dwellings are visible from the frontage of the site and generally the surrounding land is flat and used for cropping purposes.

A site context plan is attached at Annex 3

Native / Exotic Vegetation and Native Fauna

The study site has been extensively modified through broad acre cropping and sheep grazing. The original vegetation over the study site has been almost entirely cleared, however five patches of modified Woorinen Mallee Ecological Vegetation Class (EVC) are present (Figure 2 in the Biosis report). A number of other areas within the site fit the description of native vegetation because they have greater than 25% cover of native species. However, this native vegetation has re-established in previously tilled areas and may be regarded as degraded treeless vegetation, the determination of which is at the discretion of the Department of Sustainability and Environment (DSE).

The site is comprised of five principal paddocks, all of which have been recently cropped; and five patches of Woorinen Mallee EVC, consisting of three habitat quality zones.

Three terrestrial fauna habitat types occur within the study site: Mallee woodland; pasture and crops; and farm dams. No flora species of national or state conservation significance were recorded within the study site during the present assessment. No fauna species of national conservation significance were recorded; however, one fauna species of state significance, Black Falcon (*Falco subniger)*, was recorded within the study site during the present assessment.

Native vegetation patches and the scattered trees within the study site have regional significance for conservation due to their role in the regional wildlife corridor network and the presence of regionally significant flora and fauna species.

Soil

The Geological Survey of Victoria, Mildura sheet, shows the site to be located on Quaternary aged Pleistocene deposits of Woorinen formation. This formation is generally defined as Aeolian deposits of dune sand, calcareous, clayey, palaesols with this being generally confirmed by the field data.

The field investigation indicated that the soil profile varies across the site, but is consistent with Woorinen formation. Some of the more significant findings from the boreholes and test pits are listed below:

- The presence of silt in the deeper holes at depths of 3.5 to 5m and 6 to 17.5m (D1), 4 to 19m (D2) and 3 to 17m (D3).
- The presence of Silt in the shallow holes and test pits at depths of 2.0m (TP5), 2.4m (D9) and at 3m or below in some of the other boreholes and test pits.
- The presence of fine Sand in D8 and TP10 down to 1.4m, down to 1.6m in D7, down to 2.0m in D10, down to 3.0m in TP7.
- Some lower strength material in BHs D1 at 7m (N=11), D3 at 1m (N=9), D7 at 3m (N=9), D8 at 3m (N=6), D10 at 3m (N=8), D11 at 3m (N=7), and D12 at 3m (N=4/PP=120kPa).

The presence of silt is widespread across the site at depths below 3 metres, with

shallow silt (less than 3m) at TP 5 and BH D9.

Groundwater

A groundwater monitoring well was installed in BH D3, with the other deep boreholes left open for a few days to assess the water level. After developing the well and allowing regeneration, the water level was measured at a depth of 15.4m in D3. In boreholes D1 and D2, they were left for over a week to settle, and then measured with the water levels being at depths of 15.4 and 16.9m respectively. It should be noted that the approximate reduced level of D1 is 49m, D2 is 54m and D3 around 49m. This indicates that the ground water is at an approximate RL of 34 to 37 metres.

Road Frontages

This access is via Carwarp West Road from the Calder Highway to South West Angle Road and then direct access to the site from either road frontage. Carwarp West Road is a local road which runs to the west from the Calder Highway at Carwarp. The road runs from Carwarp through the Murray – Sunset National Park and the South Australian border. Between the Calder Highway and Ward Road, Carwarp Road has a sealed pavement approximately 6.0 metres in width in fair condition. West of Ward Road, the road has a gravel pavement approximately 8 metres wide with a good, well maintained surface. Carwarp West Road intersects with South West Angle Road approximately 600 metres west of the highway forming a Y junction.

The intersection of Calder Highway and Carwarp West Road forms a T junction, controlled by Give Way signs assigning priority to the highway. The traffic assessment prepared for the project by Cardno Grogan Richards noted that this intersection may be required to be upgraded.

All access points to the site have gates used for farm machinery access and have sufficient clearance from roadside vegetation to allow adoption for construction access to the site.

Site Area (If Known)Carwarp Site = Approximately 1200 (hectares)

Route length (for linear infrastructure) N/A……. (km) **and width** N/A…….. (m)

Current land use and development:

The land is currently used for dry land farming and occasional sheep grazing. The land does not contain any buildings. Typical rural fencing exists along property boundaries.

Description of local setting (eg. adjoining land uses, road access, infrastructure, proximity to residences & urban centres):

The eastern tip of this irregular shaped lot is located approximately 500 metres from the township of Carwarp which contains approximately ten (10) dwellings.

The Carwarp wheat silos and associated infrastructure characterise the small township and the intersection of Carwarp West Road with the highway. Two

large telecommunication towers are located at the edge of the small township. Excluding the small township and nearby infrastructure, the area is generally used for dry land farming or ancillary uses such as wheat stores or farm dwellings.

No dwellings are visible from the frontage of the site and generally the surrounding land is flat and used for cropping purposes. Typical rural fencing exists along property boundaries. The Carwarp is completely screened from the site by topography and existing native vegetation.

Carwarp West Road is a narrow dirt road with an approximate 10 metre verge on the south side and 5 metre verge on the north side. The site is bounded by Cleary Road to the South, Southwest Angle Road to the southeast, Carwarp Road to the north and an unnamed road to the west. The Calder Freeway is located approximately 600 metres to the east of the east tip of the site

Planning context (eg. strategic planning, zoning & overlays, management plans):

This site is subject to the Mildura Rural City Council Planning Scheme.

The site is included in a Farm Zone (FZ) and is not subject to any Overlay controls. The broader area is generally included in the Farm Zone with some exceptions for the Public Conservation and Recreation Zones (PCRZ) over some of the nearby public land and the Public Use Zone 1 (PUZ1) within the township of Carwarp.

It is proposed to seek approval for the SEF through a Planning Scheme amendment that adopts an Incorporated Document with site specific controls into the Mildura Rural City Council Planning Scheme. These controls will apply in addition to the underlying FZ that applies to the land.

Carwarp Site Zoning Context

A summary of the State and Local Planning policies that are of relevance to the application can be found at annex 6.

Local government area(s): Mildura Rural City Council

8. Existing environment

Overview of key environmental assets/sensitivities in project area and vicinity (cf. general description of project site/study area under Section 7)**:**

The key environmental assets/sensitivities in the project areas are summarised as follows:

1. Protection of biodiversity in included threatened flora and fauna
2. Protection of productive land and soils – soil stability
3. Protection of non indigenous and indigenous heritage
4. Restrictions on water use and protection of water resources

See the above sections and further details in Section 11 and Section 17.

9. Land availability and control

Is the proposal on, or partly on, Crown land?

☒ No ☒ Yes If yes, please provide details.

Current land tenure (provide plan, if practicable):

Private freehold land

Intended land tenure (tenure over or access to project land):

The land will either be leased or purchased from the current freehold owners

Other interests in affected land (eg. easements, native title claims):

There are no easements that affect either of the site and no native title claims that affect the site.

10. Required approvals

State and Commonwealth approvals required for project components (if known):

State Approvals

The proposed solar energy facility could require approval under the following Victorian Legislation:

- **Environment Effects Act 1987**
- **Planning and Environment Act 1987**
- **Flora and Fauna Guarantee Act 1988**
- **Heritage Act 1995: and**
- **Aboriginal Heritage Act 2006**

Environment Effects Act 1987

It is anticipated that the project will not trigger the requirement for an Environmental Effects Statement (EES) to be prepared under the Environmental Effects Act 1978.

It is noted the project in this referral is being submitted for 'assessment' under the Environmental Effects Act 1987 but do not require an 'approval' under the Act.

Planning and Environment Act 1987

Approval is required for the project pursuant to the Planning and Environment Act 1987 for a planning scheme amendment/s that will introduce a site-specific use and development control(s) by the introduction of an incorporated document enabling the use and development of the land for a Solar Energy Facility. The incorporated document (including any relevant development plans) will be adopted into and form part of the Mildura Rural City Council Planning Scheme. A permit would be required from Mildura Rural City Council under the Victorian *Planning and Environment Act 1987* if it is proposed to remove native vegetation, including scattered trees. A copy of the draft incorporated document is attached at annex 7 for your reference.

This is the same planning approval process that was adopted for the Solar Systems Solar Energy Test Facility (SETF) at Bridgewater in the Shire of Loddon. The use of an incorporated document (and attendant nomination in the schedule to Clause 52.03) as the mechanism by which the use and development of the land is regulated preserves the existing or underlying zoning of the affected land. Indeed, the express purpose of clause 52.03 is to provide for "extraordinary circumstances" such as this. This approach is not uncommon for large projects of State significance or unique proposals where a more conventional approvals process such as a land rezoning or achieving a planning permit is inadequate or inappropriate.

The incorporated document will include the requirement for the preparation of an Environmental Management Plan (EMP).The EMP will be to the satisfaction of DPCD (and DSE) and the Responsible Authority.

Flora and Fauna Guarantee Act 1988

The site has good opportunities for access without significant removal of vegetation. However, if native vegetation is required to be removed in the road reserves (subject to more detailed investigation) then a licence may be required under the **Flora and Fauna Guarantee Act 1988.** This may be necessary should road widening be required at the intersection of Carwarp West Road and the Calder Highway.

Heritage Act 1995

The Cultural Heritage assessment completed for the site noted that "There are no non-Indigenous heritage issues for Solar Systems to mitigate against or to plan for at Carwarp, and no further historical archaeological assessment is required or recommended for this site unless an EES is being prepared (Section 2.3.1). However, as a matter of course, in the unlikely event that non-Indigenous cultural heritage was discovered it must be remembered that Section 127 of the **Heritage Act 1995** will apply.

Aboriginal Heritage Act 2006

No place(s) of Aboriginal Cultural Heritage were identified on the Carwarp Site (Site D) during the assessment conducted by SKM Pty Ltd. If a Cultural Heritage Management Plan (CHMP) is required pursuant to the **Aboriginal Heritage Act 2006** then one will be prepared in consultation with the relevant Registered Aboriginal Parties).

Commonwealth Approvals

The proposal may also require assessment under the Environment Protection and Biodiversity Act 1999 (EPBC Act). A referral will be lodged with the Department of Environment, Water, Heritage and the Arts (DEWHA). It is anticipated that the proposal will not be considered a 'controlled action' and will not required further assessment under the EPBC Act 1999.

Have any applications for approval been lodged?

☒ No ☒ Yes If yes, please provide details.

Approval agency consultation (agencies with whom the proposal has been discussed):

In developing and implementing the north-west Victoria large scale solar power station Consultation Strategy, Solar Systems set out to raise community and stakeholder awareness of the proposal and offer a genuine opportunity to discuss and provide feedback on it. Solar Systems also set out to develop real and ongoing relationships with the Sunraysia community and project stakeholders.

Solar Systems are confident that the objectives of the Consultation Strategy have been overwhelmingly met. This has been accomplished through the provision of significant resources by the company during the community consultation period. Solar Systems also implemented a number of additional consultation measures in response to the community feedback during the consultation process. This has resulted in broad and effective two way communication with the Sunraysia

community.

While the formal community consultation period was held in November and December 2008, many communication initiatives occurred prior to, and after this timeframe.

Solar Systems distributed information throughout the broader community by a number of methods. This included presentations at forums, talking to the community at information stands and the Project Information Centre, distribution of information packs, media releases and phone calls to name just a few.

In summary the following agencies were consulted:

- The Mildura Rural City Council (MRCC).
- Department of Planning and Community Development (DPCD).
- Department of Sustainability and Environment (DSE).
- Department of Primary Industries (DPI).
- Department of Innovation Industry and Regional Development (DIIRD).
- Department of Environment, Water, Heritage and the Arts (DEWHA).

Other agencies consulted:

- Local indigenous group representatives.
- Country Fire Authority (CFA).
- Lower Murray Water (LMW).
- The Civil Aviation Safety Authority (CASA).
- Air Services Australia.
- Vic Roads.
- Powercor.
- Land care groups.
- Environmental groups and associations.
- Relevant Members of Parliament.
- Relevant Ministers (Minister for Planning, Minister for Environment and Climate Change and Minister for Energy and Resources covering the relevant Acts as specified in Section 19(1)(c) of the Planning and Environment Act 1987.

Community Consultation

In addition to the above agencies Solar Systems undertook an extensive community consultation process which included the opening of a Project Information Centre in Mildura, a range of community forums and communication through a range of media avenues and the mail. The response from the community has been resoundingly positive and it is clear there is full support for the project to go ahead.

Consultation Outcomes

The agencies and the community have shown resounding support for the project. Solar Systems has not received any letters of objection or concern in relation to the project to date. The consultation strategy and the Consultation Outcomes Report are attached at Annex 8.

PART 2 POTENTIAL ENVIRONMENTAL EFFECTS

11. Potentially significant environmental effects

Overview of potentially significant environmental effects (identify key potential effects and comment on their significance and likelihood, as well as key uncertainties):

Solar Systems has commissioned a range of studies to assist the assessment of the environmental effects of this project including the determination as to whether this project requires an EES to be prepared under the Environmental Effects Act 1978. These include analysis of biodiversity, cultural heritage, geotechnical conditions, visual impact, socio economic impact and traffic impact assessment. Copies of these reports are attached at annexes 9 to 15.

If the project is constructed on this site then the potentially significant impacts are as follows:

Clean Energy

The most significant environmental effect of the project will be the advancement of clean energy technology that will be critical in the state, national and international climate change mitigation measures and current and future carbon pollution reduction schemes. The development and optimisation of solar technology at the utility scale is of particular importance to Australia given our abundant solar resource and will form an invaluable addition to the renewable energy options and reliability. At completion the project will result in the reduction of approximately 400,000 tonnes of CO^2 (e), which is equivalent to taking approximately 93,000 cars off the road.

The proposal is considered to support the actions, plans and policies set out in the following State Government documents:

- Victorian Greenhouse Strategy Action Plan Update (2005)
- Our Environment Our Future: Victoria's Sustainability Action Statement 2006,
- Renewable Energy Action Plan 2006

Flora and Fauna

The proposed development envelope for the Solar energy facility encompasses approximately 20 scattered trees varying age and condition, which may also require removal. These trees are normally deemed as having medium conservation significance given the EVC but because they are deemed to provide the remaining 50% habitat for Regent Parrot, Greater Long Eared Bat, Hooded Robin, Crested Bellbird and Muellers Skink their significance is elevated to high. Again it is not expected that all of these trees will require removal however without the benefit of the final detailed design the assumption must be full removal.

The final design of the SEF will not be known until completion of optimisation work at the Bridgewater SEFT and detailed design is completed. The design may also be subject to further change as stages are completed on site. Therefore the full amount of vegetation removal is unknown and the assumption must be that all of

these scattered trees will be removed.

However, it is considered the removal of 20 scattered trees from this site is not likely to have a significant impact on the abundance or distribution of these species as;

- the removal of 20 scattered trees represents an incredibly small percentage of the remaining 139,369 ha of Woorinen Mallee EVC in the Murray Mallee Bioregion (Mallee CMA Native Vegetation Plan 2006 page 18),
- there are opportunities to protect other vegetation of the same EVC on the site and achieve Net Gain, there are significant amounts of this EVC within this bioregion protected under conservation reserves,
- this EVC is less vulnerable to wildfire and therefore less threatened by further depletion through wildfire.
- It is anticipated that Solar Systems will undertake additional screen planting using indigenous vegetation on the site which will increase habitat on the site in the long term. This is discussed in further detail in the next Section.

As such, the removal of this small amount of vegetation is not likely to have a significant impact on the respective fauna.

It addition the site has been identified through an exhaustive and comprehensive site selection/due diligence process with the minimisation of environmental impacts being one of the key site selection criteria. As such this site is considered to have equal or less environmental sensitivities and possible alternatives that meet other criteria such as appropriate solar resource and proximity to the power network. It is widely accepted that this project is of State, National and International environmental (and economic) importance. On balance, it is therefore considered there are reasonable grounds for removal of vegetation in this instance.

See Annex 9 for the full biodiversity assessment prepared by Biosis Pty. Ltd.

Cultural Heritage

The Cultural Heritage assessment completed by SKM concluded that this is not considered to contain any significant indigenous or non-indigenous cultural heritage. The proposal is unlikely to have a significant environmental effect from a cultural heritage perspective.

See Annex 10 for a full Cultural Heritage Assessment.

Landscape

The visual impact assessment prepared by ERM for the site concludes that the development will have low visual impact for the sites under consideration for Solar Energy Facility. None of the sites and their respective view sheds have visually significant landscape characteristics that preclude the development of a Solar Energy Facility. Based on the assessment by ERM it is considered unlikely that the project will have significant environmental effects from a visual perspective. This is discussed in more detail under section 14 and in the assessment report annexed at attachment 11.

Summary of Potential Environmental Effects

The only significant environmental effects resulting from the project will be the positive effects of advancing the development and deployment of clean energy technologies.

12. Native vegetation, flora and fauna

Native vegetation

Is any native vegetation likely to be cleared or otherwise affected by the project?

☐ NYD ☐ No ☒ Yes If yes, answer the following questions and attach details.

Carwarp (Site D)

Approximately 20 scattered trees on the site are located within the SEF development and it is anticipated that some scattered trees may require removal. However, the detailed design process will allow for the development of a layout that seeks to minimise the removal of this vegetation and utilises the principals of Victoria's Native Vegetation Framework.

The biodiversity assessment prepared by Biosis notes that a number of scattered trees occur throughout the site, mainly Oil Mallee *Eucalyptus oleosa*, but also a few Belah *Casuarina pauper* in the northeastern portion and the mid-east boundary of the site. Some of these trees are hollow-bearing and provide habitat for fauna species. Removal of scattered trees should be avoided where possible.

What investigation of native vegetation in the project area has been done? (briefly describe)

A flora and terrestrial fauna assessment has been completed for the site by Biosis Pty Ltd and the report is attached at Annex 9.

What is the maximum area of native vegetation that may need to be cleared?

☒ NYD

Approximately 20 scattered trees of varying size and type are located within the SEF development envelope and may require removal.

How much of this clearing would be authorised under a Forest Management Plan or Fire Protection Plan?

☒ N/A …… approx. percent (if applicable)

Which Ecological Vegetation Classes may be affected? (if not authorised as above)

☐ NYD ☒ Preliminary/detailed assessment completed. If assessed, please list.

The scattered trees are also considered to be of the Woorinen Mallee EVC

Have potential vegetation offsets been identified as yet?

☒ NYD ☒ Yes If yes, please briefly describe.

It is anticipated that any offsets required could be provided by the protection of existing remnant stands of native vegetation within each respective site, which have already been nominated as SEF use and development exclusion zones and are from a matching EVC. These areas will be protected by the planning scheme as the concept plan containing the exclusion zones will be included in the incorporated document that is ultimately adopted into the planning scheme. In addition, given the generous size of the site, opportunities for offset plantings exist within each respective site.

It is noted that where offset planting is required it could be undertaken along property boundaries abutting roads or road reserves where it will be contiguous with existing vegetation within the road reserves and add value to these stands of vegetation. A landscape buffer has been proposed for these areas within the concept plan. Where relevant it may also add to the visual screening provided by this vegetation. All offset planting would be done in accordance with Victoria's Native Vegetation Framework.

Other information/comments? (eg. accuracy of information)

NYD = not yet determined

Flora and fauna

What investigations of flora and fauna in the project area have been done? (provide overview here and attach details of method and results of any surveys for the project & describe their accuracy).

As summarised in Section 11 a biodiversity assessment for each site has been undertaken by Biosis Pty. Ltd. Copies of these reports are provided at Annex 9. The aim of the assessment was to identify any constraints to the project with respect to native flora and fauna; and to guide project design within the site.

Have any threatened or migratory species or listed communities been recorded from the local area?

☒ NYD ☒ No ☒ Yes If yes, please:

- List species/communities recorded in recent surveys and/or past observations.
- Indicate which of these have been recorded from the project site or nearby.

Carwarp Site(Site D)

Significant flora species:

Flora of national or state significance recorded or predicted to occur within

10 km of the study site is listed below.

Australian status:

CE Listed under EPBC Act as critically endangered
E Listed under EPBC Act as endangered
V Listed under EPBC Act as vulnerable
R Rare (Briggs & Leigh 1996)

Victorian status (DSE Flora Information System, 2007 Version):

e Endangered
v Vulnerable
r Rare

Source of record:

FIS: Recorded within 5 km of centre of study site, DSE Flora Information System
DEWHA: Predicted to occur in local area, EPBC Act Protected Matters Search Tool

Likelihood scale:

Terminology	Likelihood of occurrence
Recorded	Has been recorded
Likely	Greater than 50% probability
Unlikely	Less than 50% probability
Negligible	Very little or no likelihood of occurrence

Scientific name	Common name	Aust status	Vic. status	Source of record	FFG	Occur-rence in study site
National Significance						
Austrostipa nullanulla	Club Spear-grass	V	v	DEWHA		Unlikely
Lepidium monoplocoides	Winged Peppercress	E	e	DEWHA	listed	Negli-gible
Swainsona murrayana	Slender Darling-pea	V	e	DEWHA	listed	Negli-gible
Swainsona pyrophila	Yellow Swainson-pea	V	v	DEWHA		Unlikely
State Significance						
Abutilon otocarpum	Desert Lantern		v	FIS		Unlikely
Acacia colletioides	Wait-a-while		r	FIS		Unlikely
Allocasuarina luehmannii	Buloke			FIS	listed	Negli-gible
Atriplex acutibractea	Pointed Saltbush		r	FIS		Unlikely
Austrostipa tuckeri	Tucker's Spear-grass		x	FIS		Negli-gible
Calandrinia volubilis	Twining		r	FIS		Unlikely

	Purslane			
Chenopodium desertorum subsp. *desertorum*	Frosted Goosefoot	r	FIS	Unlikely
Eremophila oppositifolia subsp. *oppositifolia*	Twin-leaf Emu-bush	r	FIS	Neglig-ible
Eremophila scoparia	Silvery Emu-bush	r	FIS	Neglig-ible
Eriochlamys behrii s.s.	Woolly Mantle	r	FIS	Unlikely
Jasminum didymum subsp. lineare	Desert Jasmine	v	FIS	Unlikely
Marsdenia australis	Doubah	v	FIS	Unlikely
Sarcozona praecox	Sarcozona	r	FIS	Neglig-ible
Sida intricata	Twiggy Sida	v	FIS	Unlikely
Templetonia egena	Round Templetonia	v	FIS	Unlikely

Significant fauna species:

Fauna of national or state significance recorded, or predicted to occur, within the local area are listed below.

Source: DSE Atlas of Victorian Wildlife, DEWHA database, BA database (1998-2008)

- AVW data search encompassed a 10 km radius (fish removed)
- DEWHA and BA data search encompassed a 10 km radius

Status of species:

CR critically endangered
EN endangered
VU vulnerable
CD conservation dependent
NT near threatened
DD data deficient (insufficient known)
R rare or insufficient known
L listed under Flora and Fauna Guarantee Act

Sources used to derive species status:

EPBC *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
DSE Advisory List of Threatened Vertebrate Fauna in Victoria (DSE 2007b)
FFG *Flora and Fauna Guarantee Act 1988* (Vic.)
Action Plans: Maxwell et al. (1996) for marsupials and monotremes, Duncan et al. (1999) for bats, Lee (1995) for rodents, Garnett and Crowley (2000) for birds, Cogger et al. (1993) for reptiles, Tyler (1997) for amphibians, and Wager and Jackson (1993) for freshwater fishes.
# denotes species predicted to occur or with habitat predicted to occur in the local area (DEWHA database)

Likelihood scale:

Terminology	Likelihood of occurrence
Recorded	Has been recorded
Likely	Greater than 50% probability
Unlikely	Less than 50% probability
Negligible	Very little or no likelihood of occurrence

Scientific name	Common name	Last record	EPBC Act	DSE 2007	FFG Act	Action Plan	Occur-rence in study site
National significance:							
Leipoa ocellata	Malleefowl	1997/#	VU	EN	L	VU	Unlikely
Rostratula australis	Australian Painted Snipe	#	VU	CR	L	VU	Negli-gible
Polytelis anthopeplus	Regent Parrot	1999/#	VU	VU	L	EN	Likely
Lathamus discolor	Swift Parrot	#	EN	EN	L	EN	Unlikely
Pachycephala rufogularis	Red-lored Whistler	#	VU	EN	L	NT	Unlikely
Stipiturus mallee	Mallee Emu-wren	1997/#	VU	EN	L	VU	Unlikely
Manorina melanotis	Black-eared Miner	#	EN	EN	L	EN	Unlikely
Nyctophilus timoriensis (eastern form)	Greater Long-eared Bat	#	VU	VU	L	VU	Likely
Litoria raniformis	Growling Grass Frog	1961	VU	EN	L	VU	Negli-gible
State significance:							
Ardea modesta	Eastern Great Egret	#		VU	L		Negli-gible
Haliaeetus leucogaster	White-bellied Sea-Eagle	#		VU	L		Unlikely
Falco subniger	Black Falcon	2006		VU			Record-ed
Lophocroa leadbeateri	Major Mitchell's Cockatoo	2004		VU	L	NT	Likely
Melanodryas cucullata	Hooded Robin	2006		NT	L	NT	Unlikely
Oreoica gutturalis	Crested Bellbird	2006		NT	L	NT	Unlikely
Cinclosoma castanotum	Chestnut Quail-thrush	1986		NT		NT	Unlikely
Climacteris picumnus victoriae	Brown Treecreeper	2007		NT		NT	Likely
Lichenostomus plumulus	Grey-fronted Honeyeater	2006		VU			Unlikely
Struthidea cinerea	Apostlebird	2007			L		Unlikely
Regional significance:							

Gallinago hardwickii	Latham's Snipe	#	NT	Negligible
Circus assimilis	Spotted Harrier	1999	NT	Likely
Todiramphus pyrrhopygia	Red-backed Kingfisher	1999	NT	Unlikely

Migratory species:

Migratory fauna species recorded, or predicted to occur, within 10 kilometres of the study site are listed below.

Source: DSE Atlas of Victorian Wildlife, DEWHA database, BA database (1998–2008

Note:
Species in bold were recorded in the study site during the present assessment.
# denotes species predicted to occur or with habitat predicted to occur in the local area (DEWHA database)

Scientific name	Common name	Last record
Leipoa ocellata	Malleefowl	1997/#
Gallinago hardwickii	Latham's Snipe	#
Rostratula australis	Australian Painted Snipe	#
Ardea modesta	Eastern Great Egret	#
Haliaeetus leucogaster	White-bellied Sea-Eagle	#
Merops ornatus	Rainbow Bee-eater	2000/#
Hirundapus caudacutus	White-throated Needletail	#
Apus pacificus	Fork-tailed Swift	#
Manorina melanotis	Black-eared Miner	#
Ardea ibis	Cattle Egret	#

If known, what threatening processes affecting these species or communities may be exacerbated by the project? (eg. loss or fragmentation of habitats)
Please describe briefly.
No processes are known.

Are any threatened or migratory species, other species of conservation significance or listed communities potentially affected by the project?

☒ NYD ☒ No ☒ Yes If yes, please:

- List these species/communities:
- Indicate which species or communities could be subject to a major or extensive impact (including the loss of a genetically important population of a species listed or nominated for listing). Comment on likelihood of effects and associated uncertainties, if practicable.

The project will result in the removal of scattered trees from the site.

The report prepared by Biosis notes that scattered trees provide the "remaining 50%" of habitat for Regent Parrot (vulnerable) and Greater Long-eared Bat. One species of State significance, the Black Falcon Falco subniger was recorded during the site assessment.

The Black Falcon was observed foraging over the site. The report by Biosis notes that this is likely to be a regular occurrence and on rare occasions, pairs may breed in the local area, particularly in the years of rain and abundant stubble Quail, which is their primary prey. It is also likely that scattered trees form part of their habitat.

It is not considered the project will unreasonably impact on these species or any other threatened or migratory species, other species of conservation significance or listed communities for the following reasons:

It is not considered the project will unreasonably impact on threatened or migratory species, other species of conservation significance or listed communities for the following reasons:

- The Malle Catchment Management Authority Native Vegetation Plan 2006 notes that within Murray Mallee Bioregion the remains the following amount Woorinen Malle EVC:

  Total area current: 139,369ha
  Area in conservation reserves: 98,454 Area in other public land areas: 7,179ha
  Area in private land: 32,894
  Unknown location: 842

  There are also significantly larger tracts of similar farm land containing larger numbers of scattered trees within the region that would provide equally suitable habitat for the above species.

  As such removal of approximately 20 scattered trees represents a very small percentage of the remaining EVC/habitat which contains both in tact vegetation and scattered trees and the impact on population numbers the aforementioned species through decline or loss of breeding habitat will be negligible. It is also of relevance that the majority of the remaining areas are within conservation reserves and likely to be protected and this type of bushland is less prone to depletion through wildfires.

  There are a number of patches of more in tact remanent vegetation within the site of the same EVC with a matching or high conservation status than that of the scattered trees. These patches also contain large old trees with hollows that can provide refuge or alternative habitat for these two species. This will enable the retention of habitat identified as potentially suitable for the species noted above and Net Gain could be achieved through protection of these areas of vegetation.

- Solar Systems has been through an extensive and exhaustive site selection/due diligence process for this project exploring a range of alternatives and as noted above one of the key criteria has been minimising

environmental impacts. As such it is contended that the subject site has equal or less impact than any other potential sites that are suitable and available for this project.

- The are no flora of State significance recorded or predicted to occur on the site.
- A 50-100 metre setback from the site boundary has been proposed on the Concept Plan, which will minimise impact and disturbance on vegetation located along the site boundary. It is proposed that some of these buffers will be planted out with indigenous vegetation providing further habitat in a continuous length and in many cases contiguous with existing vegetation located along existing boundaries.
- It is understood that it is uncommon for the Regents Parrot to cross large open paddocks and therefore unlikely to use the scattered trees on this site given their remoteness within the site.
- The environmental management plan prepared for the development and ongoing operation of the site will provide an opportunity to ensure that vegetation removal is minimised where possible and any screen planting is indigenous to the area.
- Solar Systems, both in our sector and our operations is committed to ecological sustainability and as such will seek to maximise vegetation retention and enhance indigenous vegetation and associated habitat through additional planting.

Is mitigation of potential effects on indigenous flora and fauna proposed?

NYD ☐ No ☒ Yes If yes, please briefly describe.

Mitigation of potential impacts will be examined where scattered tress are required to be removed. Any mitigation measures will be determined in consultation with DSE and where relevant with Victoria's Native Vegetation Management: A Framework for Action. Solar Systems voluntarily propose to protect the existing remnant stands of native vegetation on the site under development exclusion zones. These stands of vegetation are from the same EVC and assessment to have a matching or higher level of conservation significance (high or very high). In addition, Biosis has indicatively advised that the areas of vegetation being protected are considered adequate to provide the necessary offsets for vegetation removal (subject to further consultation DSE). Solar System will also bolster existing vegetation screen along boundaries with indigenous plantings. This combined with significant opportunities for additional planting is considered to provide excellent opportunity to mitigate any effects where necessary.

Furthermore, It is envisaged that an Environmental Management Plan (EMP) will be developed; which will incorporate the design, construction and operational environmental management measures proposed. This will include (but not be limited to) issues relating to vegetation/habitat management, weed control, and erosion and sediment control.

Other information/comments? (eg. accuracy of information)

13. Water environments

Will the project require significant volumes of fresh water (eg. > 1 Gl/yr)?

☐ NYD ☒ No ☐ Yes If yes, indicate approximate volume and likely source.

Will the project discharge waste water or runoff to water environments?

☐ NYD ☐ No ☒ Yes If yes, specify types of discharges and which environments.

There will be one minor source of wastewater discharge from the project. This will be grey water and black water disposal from the temporary and permanent buildings on site. This will be disposed on site and will be required to be compliant with the EPA code practice, which will ensure there are no adverse impacts on groundwater.

Are any waterways, wetlands, estuaries or marine environments likely to be affected?

☐ NYD ☒ No ☐ Yes If yes, specify which water environments, answer the following questions and attach any relevant details.

Are any of these water environments likely to support threatened or migratory species?

☐ NYD ☒ No Yes If yes, specify which water environments.

Not applicable

Are any potentially affected wetlands listed under the Ramsar Convention or in 'A Directory of Important Wetlands in Australia'?

☐ NYD ☒ No ☐ Yes If yes, please specify.

Not applicable

Could the project affect streamflows?

☐ NYD ☒ No ☐ Yes If yes, briefly describe implications for streamflows.

Could regional groundwater resources be affected by the project?

☐ NYD ☒ No ☐ Yes If yes, describe in what way.

It is anticipated that the foundations of the towers (being the largest foundations) will not impact on underground water bodies, and/or groundwater. The Geotechnical investigations carried out found that the depth to ground water was 15 metres for the **Carwarp Site (Site D)**.

Given the soil profile of the site (deposits of silt), any foundations would have to be designed to avoid contact with the water table. It is not anticipated there will be potential for any other impacts on groundwater resources.

Could environmental values (beneficial uses) of water environments be

affected? ☐ NYD ☒ No ☐ Yes If yes, identify waterways/water bodies and beneficial uses (as recognised by State Environment Protection Policies)
Could aquatic, estuarine or marine ecosystems be affected by the project? ☐ NYD ☒ No ☐ Yes If yes, describe in what way.
Is there a potential for extensive or major effects on the health or biodiversity of aquatic, estuarine or marine ecosystems over the long-term? ☒ No ☐ Yes If yes, please describe. Comment on likelihood of effects and associated uncertainties, if practicable.
Is mitigation of potential effects on water environments proposed? ☐ NYD ☒ No ☐ Yes If yes, please briefly describe.
Not applicable
Other information/comments? (eg. accuracy of information)

14. Landscape and soils

Landscape

Has a preliminary landscape assessment been prepared? ☐ No ☒ Yes If yes, please attach. A copy of the preliminary landscape assessment is attached at Annex 11. This assessment covers all three sites that were investigated in detail however this referral only applies to the **Carwarp Site (Site D**).
Is the project to be located either within or near an area that is: • **Subject to a Landscape Significance Overlay or Environmental Significance Overlay?** ☐ NYD ☒ No ☐ Yes If yes, provide plan showing footprint relative to overlay.
• **Identified as of regional or State significance in a reputable study of landscape values?** ☐ NYD ☒ No ☐ Yes If yes, please specify.
• **Within or adjoining land reserved under the *National Parks Act 1975?*** ☐ NYD ☒ No ☐ Yes If yes, please specify.
• **Within or adjoining other public land used for conservation or recreational purposes*?*** ☐ NYD ☒ No ☐ Yes If yes, please specify.
Is any clearing vegetation or alteration of landforms likely to affect

landscape values?

☒ NYD ☒ No ☒ Yes If yes, please briefly describe.

Carwarp Site (Site D)

The project site and surrounding landscape is largely comprised of gently undulating and largely cleared farmland with a small stands of remnant vegetation within the site and along the boundaries of the site particularly where it abuts road reserves. Given the continuous use for productive purposes (including grain storage) the project site and many of the surrounding land forms are already highly modified. The project will only require the removal of limited amounts of scattered trees and will require levelling earth works for the construction of the SEF. It is anticipated these works will have a negligible impact on landscape values of this already highly modified area.

The visual impact assessment prepared by ERM for the site concludes that the development will have low visual impact. Farmland is rated of low sensitivity within this context as set out in the unit table below.

Landscape unit	Sensitivity
Unit 1 Farmland	Low This unit is highly modified, contains visible infrastructure, is not topographically dramatic, and does not contain large areas of water.
Unit 2 Rural Townships	Medium The concentration of houses increases the visual sensitivity of this landscape unit.
Unit 3 Parks & Reserves	High Used for recreation and to enjoy views of the landscape.

ERM conclude that none of the three sites and their respective view sheds have visually significant landscape characteristics that preclude the development of a Solar Energy Facility.

The project will require the removal of limited amounts of scattered trees and will require levelling earth works for the construction of the SEF. It is anticipated these works will have a negligible impact on landscape values of this already highly modified area.

In addition the assessment notes that;

“Site D provides the best opportunity to provide visual screening from major roads and sensitive receptors such as residential dwellings and publicly accessible locations. Should there be a tourism component to the project, the site is sufficiently screened by existing vegetation that visual impact the Calder Highway will be low, however there is direct access to the site, which would enable convenient public vehicular access should appropriate signage be installed.

Most views from both the area surrounding Carwarp and within the town itself are

dominated by the existing silos, railway sidings and telecommunications towers. These areas can absorb the level of visual change that is being proposed by the SEF."

It is noted that views to the project including towers from the township of Carwarp will be largely screened by existing advanced vegetation to the west of this township. The nearest dwelling with potential views to the site. In addition, the nearest important point of potential public recreation is the Murray Sunset National Park. This Park is located some 6.5 kilometres to the southwest of this site and the project will be imperceptible at this distance.

To this end it is considered unlikely the project will not have a significantly adverse environmental effect from a landscape values perspective.

Is there a potential for effects on landscape values of regional or State importance?

☐ NYD ☒ No ☐ Yes Please briefly explain response.

It is considered the proposal will not unreasonably impact on any landscape values of regional or State importance.

With regard to the region the landscape and visual assessment prepared by ERM notes that "cleared farm landscape with minor undulations of sand dunes are common and widespread. The sites under consideration are located within a very small area in this region."

The report further notes that "The pre-European landscape of the area surrounding the proposed Solar Energy Facility has been heavily modified through agricultural practices that have included the clearing of native vegetation for cropping and grazing. The resultant cleared landscape is interspersed with agricultural buildings including farmhouses, outbuildings, sheds, stockyards, access roads, silos as well as road and rail networks. Associated with these structures are plantings along roadsides or as shelter belts. This landscape unit is not rare, nor is it high in scenic quality and for these reasons the landscape sensitivity is considered low. However, it must be recognised that some people value the appearance of cleared farmland with minimal signs of built form such as houses and farm sheds. For these viewers the presence of receiver masts may be perceived as a high visual impact due to the presence of large-scale structures in a rural landscape."

The report then explores viewpoints to each site from determined sensitive public and private interfaces and concludes that the impact on landscape values will not be unreasonable.

In addition, it is noted that during and following the extensive public consultation undertaken by Solar Systems, there were no letters of objection or concerns raised in relation to the projects impact on landscape values

Therefore, based on the above comments and the foregoing analysis in relation to landscape impact it is not considered the proposal will unreasonably effect regional landscape values.

Is mitigation of potential landscape effects proposed?
☒ NYD ☐ No ☐ Yes If yes, please briefly describe.
The site has a significant amount of natural screening provided along the boundaries by existing vegetation within the road reserve and along boundary fences. It is anticipated that further screen planting will be provided once the final detailed design is determined. If any offset planting is required for removal of native vegetation it is expected this will be located where it is contiguous with existing native vegetation and where possible also serves a screening function.
Other information/comments? (eg. accuracy of information)

Note: A preliminary landscape assessment is a specific requirement for a referral of a wind energy facility. This should provide a description of:

- The landscape character of the site and surrounding areas including landform, vegetation types and coverage, water features, any other notable features and current land use;
- The location of nearby dwellings, townships, recreation areas, major roads, above-ground utilities, tourist routes and walking tracks;
- Views to the site and to the proposed location of wind turbines from key vantage points (including views showing existing nearby dwellings and views from major roads, walking tracks and tourist routes) sufficient to give a sense of the overall site in its setting.

Soils

Is there a potential for effects on land stability, acid sulphate soils or highly erodible soils?
☐ NYD ☐ No ☒ Yes If yes, please briefly describe.
A Geotechnical Assessment was prepared by Geotechnical Testing Services and is attached at Annex 12. The report relates to all three sites however the only the logs for the Carwarp Site have been provided with this referral. The soil types found in the area are highly mobile when disturbed and subjected to strong winds or rapid water runoff. The geotechnical investigation carried out by GTS Pty Ltd and attached an Annex 14 notes that should waterways form or be constructed (drainage channels), erosion may occur in the surface material. This is due to a lack of cohesiveness in the near surface materials. As such the project will require the implementation of appropriate soil stabilisation and erosion attenuation techniques during construction. The provisions in the proposed Incorporated Document, recommends the preparation of an Environmental Management Plan prior to the commencement of SEF. The EMP is specifically required to show as appropriate erosion and siltation control during construction. In addition, at the completion of construction appropriate measures will be implemented to ensure the soils remain stable. Options being considered include

low level vegetation such as ground covers where appropriate, laying down materials and soil binding methods such as compaction.

Are there geotechnical hazards that may either affect the project or be affected by it?

☐ NYD ☒ No ☐ Yes If yes, please briefly describe.

Other information/comments? (eg. accuracy of information)

See annex 12

15. Social environments

Is the project likely to generate significant volumes of road traffic, during construction or operation?

☐ NYD ☐ No ☒ Yes If yes, provide estimate of traffic volume(s) if practicable.

While the full construction details and logistics are yet to be determined some rudimentary figures for the project were estimated by Solar Systems Construction Team based on pervious construction experience and the experience constructing the Solar Energy Test Facility at Bridgewater which comprises one Solar Dish and HCPV field. These figures are as follows

Construction

6900 trucks movements over construction period (concrete batching contained on site)

Construction staff = 100 staff. Assume 0.9 car driver ratio = 180 vehicles per day

Operation

Operation = 44 staff @ 0.9 cars per staff = 80 vehicles per day.

NB: The **Carwarp** rail siding could be used for a significant amount of materials to be transported via rail freight and then moved the short distance to the site. This could reduce the travel distances and vehicle sizes for transporting of goods using heavy vehicles.

Is there a potential for significant effects on the amenity of residents, due to emissions of dust or odours or changes in visual, noise or traffic conditions?

☐ NYD ☒ No ☐ Yes If yes, briefly describe the nature of the changes in amenity conditions and the possible areas affected.

Carwarp Site (Site D)

There are approximately 17 residential dwellings within a 5 kilometre radius of the site, however this is largely due to the nearby township of Carwarp, which comprises approximately 11 dwellings, most of which are permanently occupied.

It is anticipated that the operation of the Solar Energy Facility will have minimal impact on the surrounding residents for the following reasons:

- the closest resident is some 500 metres from the site boundary.
- the SEF is proposed to be set a minimum of 1 km from this resident by providing the appropriate setbacks within the site (The development envelope shown on the concept).
- plan shows a minimum setback of 1.8km from the nearest dwellings located in the township of Carwarp).
- all nearby residents to the site partially screened by existing vegetation.
- no emissions created during the facilities operation.

Peak construction periods will generate a significant amount of traffic and typical construction activity around the selected site. At some points this will include the movement of cranes onto the site. However it is contented that movement of heavy vehicles and operation of machinery are typical to a rural/agricultural environment with the appropriate environmental and traffic management controls there will be no unreasonable impacts on the amenity of residents.

The socio economic impact assessment prepared by Essential Economics in association with Collaborations (attached at Annex 13) made the following conclusions:

From an economic impact perspective, the Project will make an important contribution to the Mildura economy by providing up to 150 construction jobs at peak times during the 5 year construction period, as well as a total of 44 workers involved in on-going project operation of the facility. Many of these jobs are expected to be filled by residents from the Mildura region. In addition, the employment multiplier will ensure that additional (or flow-on) jobs are created, both locally and in the Victorian and national economies.

From a social impact perspective, a number of considerations will need to be taken into account as the plans for construction and operation take shape. While issues could possibly arise in relation to a number of amenity impacts for the several existing residential properties in proximity to the candidate site, it is expected that measures can be taken to mitigate such effects. Moreover, it is evident that the Project should not have an adverse impact on demand levels for community facilities and services. The Project provides an opportunity to support community interest through flow on economic development.

In addition, the traffic study conducted by Cardno Grogan Richards attached at Annex 14 concluded that the site is suitable in access terms for the construction and ongoing operation of the proposed Renewable Energy Project.

Is there a potential for exposure of a human community to health or safety hazards, due to emissions to air or water or noise or chemical hazards or associated transport?

☐ NYD ☒ No ☐ Yes If yes, briefly describe the hazards and possible implications.

Is there a potential for displacement of residences or severance of residential access to community resources due to the proposed development?

☐ NYD ☒ No ☐ Yes If yes, briefly describe potential effects.

Are non-residential land use activities likely to be displaced as a result of the project?

☐ NYD ☐ No ☒ Yes If yes, briefly describe the likely effects.

The project will displace land within a Farming Zone that has agricultural productive value. However, whilst the development of a Solar Energy Facility is to occur on land within the Farming Zone, it is considered that the siting requirements are such that the use cannot be accommodated within the urban area. The subject land is located outside the irrigation district and there will be no significant off-site impacts that would affect rural activities in the area. In addition the significance State, National and International importance of the project from and economic development and environmental perspective is considered to further justify the displacement of a comparatively small dry land farming site.

Do any expected changes in non-residential land use activities have a potential to cause adverse effects on local residents/communities, social groups or industries?

☐ NYD ☒ No ☐ Yes If yes, briefly describe the potential effects.

Is mitigation of potential social effects proposed?

☐ NYD ☐ No ☒ Yes If yes, please briefly describe.

The project will have multiple positive effects on the community through investment and employment opportunities. The main potential for any adverse impacts on neighbouring properties is through dust and noise emissions and traffic impacts during the construction period. Whilst these are already commonly associated with some of the local agricultural based activities the intensity will be increased by this project. However, with appropriate management plan in place these impacts can be adequately mitigated.

It is noted that Solar Systems has a strong commitment to proactively working with the communities connected to our projects. This has been demonstrated on our projects in central Australia and more recently the Bridgewater Test Facility in Victoria.

Solar Systems will continue this commitment with this project as evidenced by the establishment of a permanent office in Mildura and employment of a local professional to provide an ongoing contact point for the community and key stakeholders.

Other information/comments? (eg. accuracy of information)

Cultural heritage

Have relevant Indigenous organisations been consulted on the occurrence of Aboriginal cultural heritage within the project area?

☐ No If no, list any organisations that it is proposed to consult.

☒ Yes If yes, list the organisations so far consulted.

Aboriginal Groups were consulted about the project by Solar Systems as part of the community consultation process including Mildura Aboriginal Corporation, Latje Latje people and Nyeri/Wergaia people. Rex Harradine is recognised as a senior elder for the Latje Latje people and Mark Grist a representative of the Nyeri/Wergaia people. Both were contacted throughout the consultation period and will continue to be in the lead up to, and during construction of the project. Information packs were also forwarded to them to gain a comprehensive understanding of Solar Systems the company, the technology involved and where the proposed locations for the project are. Both Mr Grist and Mr Harradine voiced their support for the project and wished to be kept up to date with developments so that they could communicate this with other people within their tribes. (Note representatives of these groups were not on site during the site assessments undertaken by SKM Pty. Ltd.)

What investigations of cultural heritage in the project area have been done? (attach details of method and results of any surveys for the project & describe their accuracy)

A detailed Cultural Heritage Assessment has been completed by SKM Pty. Ltd. and is attached at annex 10.

Is any Aboriginal cultural heritage known from the project area?

☐ NYD ☐ No ☒ Yes If yes, briefly describe:

- Any sites listed on the AAV Site Register
- Sites or areas of sensitivity recorded in recent surveys from the project site or nearby
- Sites or areas of sensitivity identified by representatives of Indigenous organisations

Sinclair Knight Mertz Pty Ltd prepared a Cultural Heritage Assessment for the project. The results of this assessment are summarised below with a copy of the full reports annexed at 10:

The site is located geographically in the *Mallee Dunefield* land system. This land system comprises scattered east-west dunes on ridges and plains. Carwarp has gently undulating topography with no distinct dune development. Previous heritage assessments and research projects conducted in the *Mallee Dunefield* indicate that this land system is of extremely low archaeological sensitivity and that isolated artefacts or at best, very sparse surface scatters comprised of

silcrete artefacts, are the most likely type of Aboriginal Place to be found there. These will be found within 500 m and more usually within 100m of ephemeral fresh or saline water sources such as inter-dunal claypans in association with of remnant vegetation where little previous disturbance has occurred.

A search of the relevant registers and planning scheme revealed that there are no previously recorded Aboriginal Places or non-Indigenous historical sites, features or heritage overlays within or close to Carwarp. Non-Indigenous physical remains are predicted to be rare. The most likely historical features are linked to the closer settlement era. These features are predicted to be linked with the development of the irrigation system within the Mallee. The Carwarp Site was inspected by Peter Holmes and Jeff Hill (Archaeologists, SKM) on the 15th and 16th October 2008.

There are no non- Indigenous archaeological sites or areas of archaeological potential noted in Carwarp. However there are at least 3 Aboriginal stakeholder groups which claim an interest in cultural heritage matters in the region. These are:

- Latji Latji Mumthelung Aboriginal Corporation;
- Wergaia; and,
- Nyeri Nyeri.

Table 5-1 and Table 5-2 in the full report provide a summary of the existing conditions and predicted cultural heritage sensitivity of Carwarp. Table 5-3 provides a ranking of high-low suitability of each site with regard to Indigenous and non-Indigenous cultural heritage values giving Carwarp a high ranking.

As no non-Indigenous cultural heritage sites, features or relics were recorded, nor were areas of non-Indigenous potential archaeological sensitivity observed, non-Indigenous is not seen as an issue at Carwarp.

The North West SEF has been identified as a **high impact activity**. Therefore, any Aboriginal Places Site encountered will trigger a **mandatory** CHMP as areas of CHS (50 m) will be demarcated around these Aboriginal Places. In addition, the presence of dunes are regarded as areas of CHS and will also trigger a **mandatory** CHMP.

Upon inspection, the landscape at Carwarp is more undulating than specific dune formations. Field inspection of Carwarp revealed there are no Aboriginal Places located there and no areas of PAS. Therefore, any CHMP prepared for Carwarp would be **voluntary** unless an EES is being prepared for this site (Section 2.3.1).

See Cultural Heritage assessment at Annex 10 for further detail.

Are there any cultural heritage places listed on the Heritage Register or the Archaeological Inventory under the *Heritage Act 1995* within the project area?

☐ NYD ☒ No ☐ Yes If yes, please list.

Is mitigation of potential cultural heritage effects proposed?

☐ NYD ☒ No ☐ Yes If yes, please briefly describe.

Other information/comments? (eg. accuracy of information)

16. Energy, wastes & greenhouse gas emissions

What are the main sources of energy that the project facility would consume/generate?

☒ Electricity network. If possible, estimate power requirement/output
☐ Natural gas network. If possible, estimate gas requirement/output
☐ Generated on-site. If possible, estimate power capacity/out put
☐ Other. Please describe.

Please add any relevant additional information.

The 154 Megawatt Solar Energy Facility is expected to produce 270,000 Megawatt hours per annum (equivalent to the average annual electricity needs of 45,000 homes) This will result in a reduction of approximately 400,000 tonnes of CO2(e) emissions per annum.

What are the main forms of waste that would be generated by the project facility?

☐ Wastewater. Describe briefly.
☐ Solid chemical wastes. Describe briefly.
☐ Excavated material. Describe briefly.
☒ Other. Describe briefly.

Please provide relevant further information, including proposed management of wastes.

It is expected that the excavated materials from the construction of footings for the SEF will be re-used on site for road construction and any landscaping or landscape mitigation measures.

What level of greenhouse gas emissions is expected to result directly from operation of the project facility?

☒ Less than 50,000 tonnes of CO_2 equivalent per annum
☐ Between 50,000 and 100,000 tonnes of CO_2 equivalent per annum
☐ Between 100,000 and 200,000 tonnes of CO_2 equivalent per annum
☐ More than 200,000 tonnes of CO_2 equivalent per annum

Please add any relevant additional information, including any identified mitigation options.

17. Other environmental issues

Are there any other environmental issues arising from the proposed project?

☐ NYD ☐ No ☒ Yes If yes, briefly describe.

Reflectivity

Given the nature of the technology the project contains a number of reflective surfaces. Solar Systems has developed a Reflectivity Management Plan to adequately mitigate any potential external impacts created by these surfaces.

A copy of the Plan is attached at Annex 15.

Electromagnetic Emissions

Another potential environmental issue associated with the project is electromagnetic capability (EMC). Any EMC issues associated with Solar Systems' HCPV technology are similar to those in many public, domestic and industrial environments. Thus, existing standards provide relevant safe exposure levels; and established test procedures verify compliance.

An EMC report is attached at Annex 16.

18. Environmental management

What measures are currently proposed to avoid, minimise or manage the main potential adverse environmental effects? (if not already described above)

☒ Siting: Please describe briefly

All significant stands of Native vegetation identified on the site have been excluded from the solar field development envelope. The development envelope is effectively a siting constraint voluntarily placed on the project to protect the remnant stands of vegetation.

☐ Design: Please describe briefly

☒ Environmental management: Please describe briefly.

An Environmental Management Plan EMP incorporating the design, construction and operational environmental management measures proposed will be developed. This will include (but not be limited to) issues relating to vegetation management (Native Vegetation Management Framework, refer Section 10), weed control, and erosion and sediment control.

☐ Other: Please describe briefly

Add any relevant additional information.

19. Other activities

Are there any other activities in the vicinity of the proposed project that have a potential for cumulative effects?

☐ NYD ☒ No ☐ Yes If yes, briefly describe.

Carwarp Site (Site D)

If the project was located on this site there is potential for relationships between the site and the rail siding located within the town and a number of telecommunications towers located around the town. These are considered to be positive synergies with existing activities that would not have any adverse effects.

20. Investigation program

Study program

Have any environmental studies not referred to above been conducted for the project?

☒ No ☐ Yes If yes, please list here and attach if relevant.

Please note: The Nowingi Waste Facility was to be located to the south of the proposed study area; environmental reports relating to this proposed project were reviewed.

Has a program for future environmental studies been developed?

☒ No ☐ Yes If yes, briefly describe.

An Environmental Management Plan will be developed for the selected site relating to both siting and construction as well as ongoing management of the facility once fully established.

Consultation program

Has a consultation program conducted to date for the project?

☐ No ☒ Yes If yes, outline the consultation activities and the stakeholder groups or organisations consulted.

Solar Systems has conducted a lengthy and comprehensive community and stakeholder consultation program for the project which has included the establishment of a project information centre in Mildura for four weeks and a number of targeted information sessions for key stakeholder and community groups within the region. Local media was utilised to disseminate information about the project. Full details can be found in the Consultation Strategy and a Consultation Outcomes report are attached at annex 8.

In summary the project has received overwhelming support throughout the consultation program. Solar Systems has not received any letters of concern or objections and is maintaining an open and transparent dialogue with all community groups and stakeholders as required.

Has a program for future consultation been developed?
☒ NYD ☒ No ☒ Yes If yes, briefly describe.

Solar Systems is proposing to formally announce the final site selection. In addition skills development programs in associated with local employment and training agencies and schools education program are currently being explored with the relevant stakeholders.

Authorised person for proponent:

I, …Ben Barnett……(full name),

……Manager – Project Development…….(position), confirm that the information contained in this form is, to my knowledge, true and not misleading.

Signature __  _

Date: 16-03-2009

Person who prepared this referral:

I, …Shane Melotte……(full name),

……..Environment and Planning Coordinator……(position), confirm that the information contained in this form is, to my knowledge, true and not misleading.

Signature ____  __

Date: 16-03-2009