PALLAMANA SOLAR FARM AND BATTERY STORAGE FACILITY

Development Application

August 2018

VOLUME 4

DRAFT CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

PALLAMANA SOLAR FARM AND ENERGY STORAGE PROJECT

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CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

RES AUSTRALIA PTY LTD

August 2018

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CONTENTS

1.0 PROJECT DESCRIPTION

RES Australia Pty Ltd (RES) propose to develop a 176MW solar farm (solar photovoltaic arrays) and battery storage facility on part of the land at 166 and 229 Hillview Road (and Monarto Road), Pallamana (Project Site), known as the Pallamana Solar Farm (Project).

The Project Site is bounded by Monarto Road to the south and Reedy Creek Road and Hillview Road to the north and is within the Rural City of Murray Bridge Council area of South Australia. The Project Site comprises approximately 780 hectares of farm land which is used predominately for grazing and cereal cropping.

The proposed solar farm and battery storage facility will consist of the following components:

- approximately 690,000 solar photovoltaic (PV) panels to be installed on a single axis tracker mount structure, with a total installed generating capacity of 176MW;
- battery energy storage facility with an indicative capacity of 66MW;
- electrical substation including step up transformer stepping up the voltage to 132kV;
- underground and overhead electrical cable reticulation;
- electrical inverter and transformer enclosures and associated electrical equipment;
- overhead transmission connection into the 132kV transmission line;
- operations and maintenance building and compound; and
- associated access roads.

2.0 DESCRIPTION OF THE LAND

2.1 Legal Description

The Subject Land is described below, with reference to land included in the development. The subject land is included in rural address 166 and 229 Hillview Road, Pallamana and comprises:

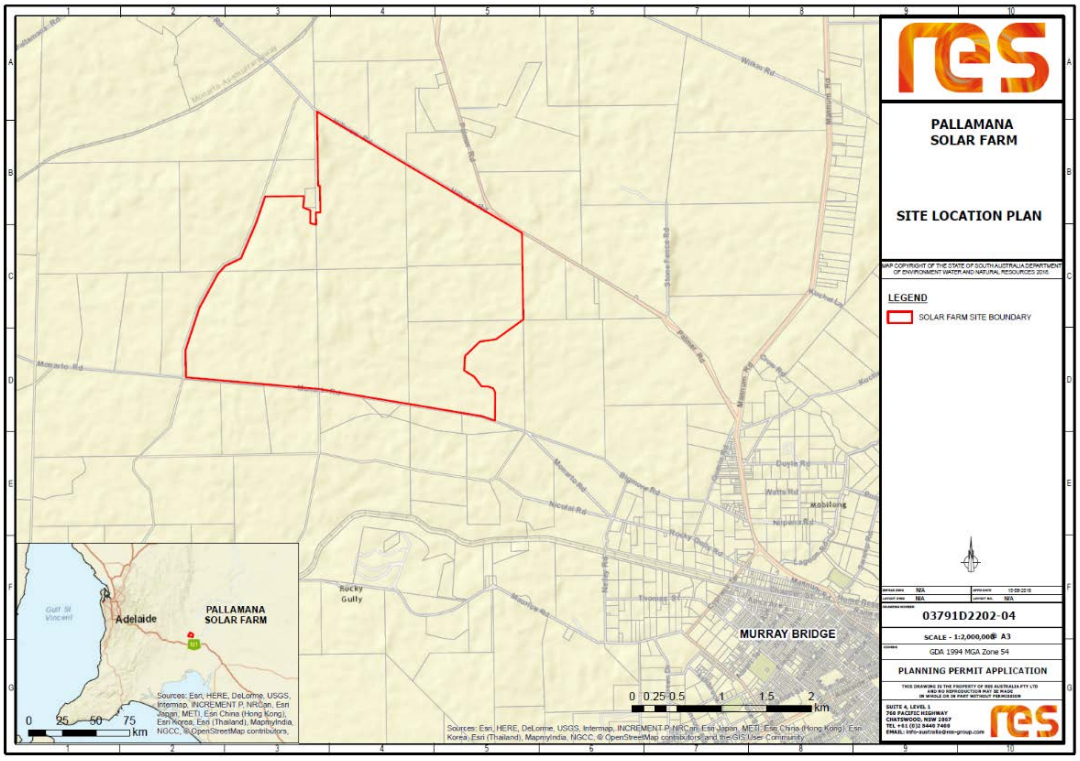
- Section 192, Hundred of Mobilong, in the area named Pallamana, Certificate of Title Volume 5858 Folio 256;
- Section 196N, Hundred of Mobilong, in the area named Pallamana, Certificate of Title Volume 5858 Folio 257;
- Sections 193 and 196S, Hundred of Mobilong, in the area named Pallamana, Certificate of Title Volume 5858 Folio 258;

- Section 197, Hundred of Mobilong, in the area named Pallamana, Certificate of Title Volume 5858 Folio 259;
- Section 166, Hundred of Mobilong, in the area named Pallamana, Certificate of Title Volume 5487 Folio 88; and
- Allotment 285, Hundred of Mobilong, in the area named Pallamana, Certificate of Title Volume 5802 Folio 294.

The Project Site covers only a portion of the Allotments/Sections which comprise the Subject Land as shown on the plans in **Volume 3** of the application documents.

2.2 Project Region

The Project Site is located approximately 4.0 kilometres north-west of the urban settlement of Murray Bridge as shown on the Site Location Plan below.



The landform and geomorphology on which the proposed solar and battery storage facility is located is formed by an undulating tableland with numerous local ridges and creeks. The underlying land cover is predominantly cropped agriculture. This rural landscape is punctuated by shelter belts of trees and woodland areas that form defined vegetated elements in the landscape. The Project site extends across an elevated plateau that forms the highest point of the Monarto tablelands between Murray Bridge and the Bremer River corridor.

2.3 Climate

Climate is described as a "Mediterranean" with peaks of growth in autumn and spring and moderate growth in winter. The nearest weather station for the Project Site is Pallamana Aerodrome Murray Bridge, South Australia (immediately north of the project area). Data is available from the Australian Meat and Livestock website for Monarto, South Australia, which illustrates the mean average rainfall and temperature in the following graph.

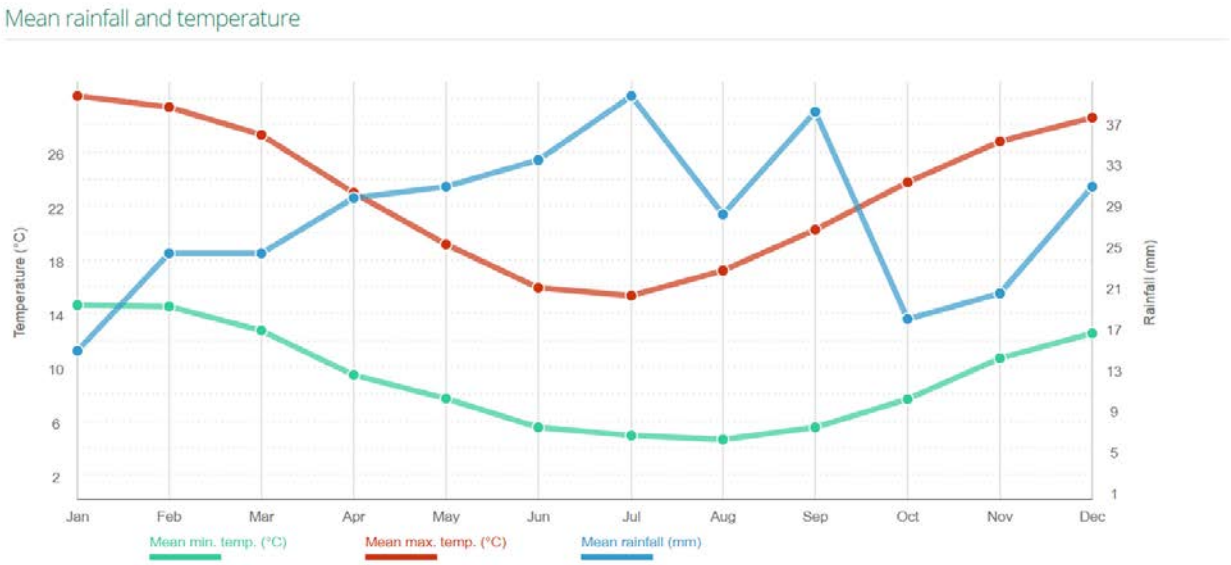


Figure 1: Mean Average monthly rainfall and temperature data for Monarto (source: Meat and Livestock Australia)

3.0 CONSTRUCTION METHODOLOGY

The main construction activities associated with the Project farm would include:

- site establishment and preparation for construction – fencing, construction of internal track system, laydown areas, upgrade of access point, preliminary civil works and drainage, and temporary construction facilities;
- installation of steel piles supporting the solar panels, which would be driven or screwed into the ground to a depth of 1.5 – 2.4 metres. No excavation for footings is required (subject to the outcome of a detailed geotechnical investigation;
- installation of framing system onto the steel piles for the solar panels;
- installation of underground cabling (trenching) up to 1,000 millimetres deep;
- installation of solar PV panels;
- construction of control room, switchroom, substation, connection infrastructure and energy storage; and
- removal of temporary construction facilities and rehabilitation of disturbed areas.

Construction of the Project comprises the following techniques to minimise environmental impacts and potential nuisance:

- delivery of components via recognised heavy vehicle transport routes, that is: the South Eastern Freeway and exit freeway to Ferries McDonald Road, Schenscher Road and Monarto Road;
- construction of the access driveway to the temporary construction compound with hard stand materials prior to delivery of major components;
- access tracks (for construction and maintenance of the solar arrays and ancillary infrastructure) would be constructed of engineered fill topped with crushed stone pavement. The driving surface would be nominally 4.0 metres wide, plus shoulders and any required drainage;
- utilisation of piles for the framing system, as opposed to traditional footings to minimise earthworks and disturbance to the existing landform;
- undertaking construction of the PV panels in "blocks" (or staged) across the Project Site in a "rolling" construction method. That is:
    - access tracks and below ground electrical conduits and cabling to connect the solar arrays to the inverters and transformers;
    - installation of piles for the framing system in rows of approximately 97m;
    - installation of tracking system and the mounting mechanism for the PV modules; and
    - installation of the PV modules and commissioning of plant.
- all excavated material would be stored and used on-site. Removal of material off site is not anticipated; and
- construction occurring between the hours of 7.00 am and 7.00 pm Monday to Saturday, with no work on Sundays or Public Holidays.

4.0 CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

4.1 Objective of the Construction Environmental Management Plan

The objective of the Construction Environmental Management Plan (CEMP) is to describe the potential environmental issues related to the proposed works and the measures which will be undertaken to manage or mitigate any detrimental impacts. The key environmental issues associated with construction of the solar farm are:

- air quality and dust control;
- cultural heritage and archaeology;
- water quality, erosion and sedimentation (SEDMP);

- storage, hazardous substances and materials;
- noise;
- traffic;
- weeds and pest management;
- flora and fauna; and
- bushfire.

This CEMP provides guidance in relation to:

- minimising environmental impacts during site works;
- identification and implementation of measures to minimise potential impacts to offsite receptors during construction; and
- establishing and implementing practices to inform site workers regarding potential environmental impacts and agreed procedures to mitigate impacts.

4.2 Environmental Management Structure and Responsibility

The implementation of this CEMP is the responsibility of the chosen construction contractor. The construction contractor may at times delegate responsibility for individual items to its sub-contractors; however, retains overall responsibility for implementation of this CEMP and any changes should the understanding of site conditions change.

The commitment of the construction contractor toward environmental protection and management will be demonstrated by:

- the finalisation of the CEMP prior to construction;
- authorisation of the CEMP by the Project Manager prior to construction;
- the communication of the plans intent to the workforce through induction, display on notice boards and at project meetings;
- the provision of resources to implement and maintain the CEMP; and
- the establishment of measurable objectives and regular reviews to ensure the suitability and effectiveness of the policy to operations.

4.3 Environmental Aspects

The potential environmental impacts along with mitigation strategies to minimise potential impacts are outlined below.

In assessing the potential off site environmental impacts, the following should be noted:

- the site of the proposed solar farm and battery energy storage comprises farm land which is used predominately for grazing and cereal cropping;
- the nearest dwelling is that located on the Subject Land and outside of the Project Site;
- the nearest non stakeholder dwelling to the solar farm is approximately 300 metres (north of Hillview Road);
- the nearest non-stakeholder dwelling to the infrastructure components or utility area (substation, construction compound etc) is approximately 700 metres to the south (south of Monarto Road). This dwelling has a setback of approximately 1.0 kilometre to the existing substation and SA Water infrastructure on Monarto Road; and
- construction will occur over an estimated 12-18 month period.

The following provides the mechanism for the management of the environment during construction, having specific regard to:

- protection of native fauna;
- protection of native flora;
- pest plants;
- pest animals;
- fire prevention and emergency response on site;
- bushfire;
- erosion and sediment;
- aboriginal cultural heritage;
- hazardous substances and spill prevention;
- noise; and
- dust generation.

4.3.1 *Air Quality and Dust Control*

Air Quality and Dust Control	
Objective	Avoid and/or minimise air quality impacts during construction.
Legislation/Policy	*Environment Protection Act 1993* *Environment Protection Regulations 2009* *Environment Protection (Air Quality) Policy 2016*
Potential Impacts	Dust during construction from: - establishment of access tracks; - excavation of footings; - construction of solar arrays, buildings, fences; - storage of materials; and - construction compound(s). Dust from vehicle movement. Exhaust fumes from construction vehicles.
Mitigation	Identify dust sensitive locations (residential dwellings etc) prior to construction activities occurring. Ensure dust generating activities are mitigated if conditions are not favourable (ie. strong winds that would release dust off site). In relation to the construction compound and laydown area: - ensure yard areas comprise a hard wearing surface, and are compacted and surfaced to minimise dust generation; - use of dust suppression treatment or water spraying as required to minimise dust;

	- restrict vehicle travelling speed (<10km/h); - limit soil stockpiles and ensure these are appropriately surfaced and/or covered; and - limit stockpile of materials adjacent property boundaries. In relation to the construction of the solar arrays: - minimise the volume of soil excavation required through the use of piles for the framing system, rather than traditional footings; - backfill and rehabilitate cable trenches as soon as practicable to minimise stockpiling of soil; and - limit vehicle movements to established access tracks. Limit bare earth exposure to that essential to the efficient and effective construction. Use vegetation cover, mulch covers or other suitable methods where possible. Rehabilitate or allow natural regeneration of bare areas as soon as the area is no longer needed for construction. Cover all loose loads for transport to and from the site Maintain sealed public roads free of trafficked soil materials. All vehicles and equipment operated on the site will comply with regulatory emission standards. Minimise machinery idling times, as appropriate.

4.3.2 *Cultural Heritage and Archaeology*

There are no items of European heritage significance on the subject land.

Cultural Heritage and Archaeology	
Objective	Manage the works to prevent or minimise impacts to sites or artefacts of indigenous heritage.
Legislation/Policy	*Native Title (South Australia) Act 1994* *Aboriginal Heritage Act 1988* *Heritage Act 1993* *Heritage Places Act 1993*
Potential Impacts	Damage to sites or artefacts of indigenous heritage.
Mitigation	Should any archaeological occurrences be located during the works, the Construction Contractor must report such an occurrence to the appropriate Aboriginal organisations and AARD in accordance with the Aboriginal Heritage Act 1988. All work is to cease that may negatively impact on the sites integrity until it has been assessed by an appropriately qualified Cultural Heritage professional with representation from the Ngarrindjeri Heritage Committee. In the event of there being an unexpected discover of additional cultural heritage site during construction, ensure site/area is protected by erecting physical barriers such as fencing or marking areas with pegs or spray paints. In the event of there being an unexpected discovery of additional cultural heritage during construction the procedure laid down in the contingency plan will be followed and induction and awareness training will be given to all construction personnel in regards to Aboriginal Cultural Heritage.

4.3.3 *Water Quality, Erosion and Sedimentation (SEDMP)*

Water Quality, Erosion and Sedimentation	
Objective	Minimise erosion and sediment laden stormwater from leaving the site.
Legislation/Policy	*Environment Protection Act 1993* *Environment Protection Regulations 2009* *Environment Protection (Water Quality) Policy 2003* *Stormwater Pollution Prevention, Code of Practice for the Building and Construction Industry*
Potential Impacts	Soil erosion can create scarring of the landscape, contaminate watercourses, lead to loss of vegetation and damage infrastructure. Contamination of surface water, including stormwater systems and public nuisance due to soil and materials on public roads.
Mitigation	Minimise construction footprint. Minimise earthworks during intense rainfall events. Minimise the loss of vegetation. Minimise the volume of soil excavation required through the use of piles for the framing system, rather than traditional footings. Backfill cable trenches as soon as practicable to minimise stockpiling of soil. Utilise existing driveways/access tracks on site for movement of vehicles. Establish new driveways/access tracks with appropriate all weather surface treatment for utilisation during construction.

	Implement sediment controls, such as sediment fencing, hay bales filters, diversion swales and sediment basins, to minimise risk of sediment from earthworks exiting the site. Ensure sediment/silt fences are installed downhill of disturbed areas that are likely to generate runoff. Ensure sediment control measures are maintained regularly to ensure effective operation at all times. Install scour protection in temporary drainage infrastructure. Install scour protection in open drains and around culvert headwalls (if required). Stabilise cleared/constructed areas with suitable pasture grasses (or similar) at the earliest opportunity upon finalisation of the construction. Maintain pasture grasses or native grasses under solar arrays post construction. Water will not be discharged from excavations unless water quality criteria are satisfied. Prior to leaving site, any vehicles driving on the public road should have tyres, wheel arches and tailgates brushed or washed down of dirt or mud as appropriate. Install all effluent treatment facilities in accordance with relevant Australian Standards and Council regulations.

4.3.4 *Storage, Hazardous Substances and Materials*

Storage, Hazardous Substances and Materials	
Objective	Avoid and/or minimise impacts associated with the release of hazardous substances or materials.
Legislation/Policy	*Environment Protection Act 1993* *Environment Protection Regulations 2009* *EPA Guidelines for Bunding and Spill Management* *Australian Code for the Transport of Dangerous Goods by Road and Rail 7th Ed, AS1940 and AS3833.*
Potential Impacts	Contamination of the environment with hazardous substances and/or materials.
Mitigation	All hazardous materials and hydrocarbons will be appropriately transported and stored during construction in accordance with relevant guidelines and regulations, to avoid release or impact to the environment. These guidelines primarily include the Australian Code for the Transport of Dangerous Goods by Road and Rail 7th Ed, AS1940 and AS3833. Adequately supplied spill kits will be kept within the vicinity of the worksite where such hazardous materials are used and stored. Appropriate persons should be contacted as soon as practicable following detection of any release or non-conformance. HHS storage areas are clearly labelled, as they will be temporary. Site inductions will clearly inform contractors and visitors of HHS storage areas. The storage, usage and handling of HHS will be managed stored according to AS 1940 and AS 3833.

Minor Storage quantities as per AS 1940 on open land will adhere to the following:

- liquid will be kept at least 1.0 metre from any boundary, workshop, dwelling or protected place, body of water, watercourse or environmentally sensitive area;
- the ground around the store will be kept clear of combustible vegetation or refuse for a distance of at least 3.0 metres; and
- any potential flow of spillage will be prevented from reaching a protected place, watercourse or property boundary by such means as the use of natural ground slope, or the provision of a diversion channel, kerb or bund.

Material Safety Data Sheets (MSDS) will be required for all hazardous chemicals kept on site. Procedures for mitigating specific impacts from materials will be governed by the appropriate MSDS.

A loss of containment of HHS will initially be controlled by bunding. Bunding and compound requirements are defined in section 5.8 of AS 1940. Bunding capacity will be the size of the largest storage vessel plus any fire water over a 20 minute period.

Employees handling, transporting or utilising hazardous materials will be trained in emergency response procedures for spill events.

4.3.5 Noise

Noise	
Objective	Avoid and/or minimise noise and vibration emissions during construction works.
Legislation/Policy	*Environmental Protection Act 1993* *Environment Protection Regulations 2009* *Environment Protection (Noise) Policy 2007* *AS2436 – 1981 "Guide to Noise Control on Construction, Maintenance and Demolition Sites"*
Potential Impacts	Noise pollution leading to loss of amenity for adjoining residents. Vibration from movement of large machinery and compaction creating nuisance to adjoining residents.
Mitigation	Identify the sensitive noise receptors and plan site establishment in a manner that maximise noise attenuation. Construction activities to be undertaken must be compliant with requirements of *Environment Protection (Noise) Policy 2007.* The adoption of "all reasonable and practicable" noise mitigation measures during daytime hours (as discussed in the Environmental Noise Assessment) which may include the following: - only operating construction plant and associated activities before 7.00 am or after 7.00 pm;

	- construction of temporary acoustic barriers for activity in close proximity to non-associated stakeholder residences (if/as required, although not expected to be required due to the distances involved between the construction activity and the residences); - proprietary enclosures around machines; - exhaust silencers; - substitution of the construction method with alternative processes that produce less noise; - the fitting of broadband reversing signals to vehicles which do not leave the site; and - administrative measures such as inspections, scheduling and providing training to establish a noise minimisation culture for the works. Plan the site establishment and traffic routes to minimise reversing alarms on plant and equipment. Provide an induction for all project team members for noise and vibration management prior to the commencement of works. Ensure all equipment is well maintained and in good working order. Restrict hours of work to 7.00 am to 7.00 pm Monday to Saturday, no construction on public holidays. If generators or such noisy machinery is utilised, locate this equipment as far as practical from the nearest residential premises not located on the site. Plant and equipment not in use to be shut down.

	Maintain complaints register and respond to any complaints received. The site should be planned to minimise the need for reversing of vehicles. All mechanical plant is to be silenced by the best practical means using current technology. Mechanical plant, including noise-suppression devices, should be maintained to the manufacturer's specifications. Internal combustion engines are to be fitted with a suitable muffler in good repair. Special assessment of vibration risks may be needed, such as for pile-driving or works structurally connected to sensitive premises. All equipment to be operated in appropriate and efficient manner. Simultaneous operations of noisy plant operating adjacent to sensitive receivers will be avoided. Where noise exceeds accepted levels and cannot be avoided, consideration will be given to applying respite periods for nearby residences. Any essential work during the night time period will be inaudible at dwellings. Inaudibility is defined as not exceeding 30dB(a) outside any dwelling. This may be exceeded in the event of an emergency situation, for example where solar arrays erection has started to continue works to ensure that the solar arrays is safe.

4.3.6 *Traffic*

Traffic	
Objective	Avoid and/or minimise impacts associated with construction traffic moving to and from the site on nearby sensitive receptors including residential dwellings and/or wildlife.
Legislation/Policy	*Road Traffic Act 1961* *Road Traffic (Road Rules – Ancillary and Miscellaneous Provisions) Regulations 1999*
Potential Impacts	Disturbance to nearby sensitive receptors including residential dwellings and/or wildlife along the construction haul route to and from site. Possible property damage through vibration impacts along haul route to and from construction site. Accelerated deterioration of local road network. Increased potential for wildlife vehicle strike on haul roads to and from site.
Mitigation	Utilise major local sealed roads for transportation of vehicles to and from the site. Minimise movement of construction vehicles to and from the site outside of the hours of 7.00 am to 7.00 pm Monday to Saturday.

4.3.7 *Flora and Fauna*

Flora and Fauna	
Objective	Avoid clearance of native vegetation and adverse impact on fauna.
Legislation/Policy	*Native Vegetation Act 1991* *Native Vegetation Regulations 2003* *Environment Protection and Biodiversity Conservation Act 1999* *Natural Resources Management Act 2004* *National Parks and Wildlife Act 1972*
Potential Impacts	Destruction of flora and fauna.
Mitigation	Provide an induction for all project team members for identification and management of protected flora and fauna prior to the commencement of works. Accurately and clearly mark out the edge of clearing and trees/vegetation to be retained. Identify, retain and protect old or mature trees (alive or dead) which are in close proximity to the corridor by marking out/fencing. Fence or mark buffer areas around protected species prior to the commencement of works. Controls in place to minimise disturbance to flora and fauna are maintained and effective. All vegetation clearing or disturbance is approved and undertaken in compliance with permits and/ or site management plans. Disturbed/exposed areas are stabilised and revegetated progressively as appropriate.

	Cease work immediately in relevant areas if any previously unknown threatened flora species are encountered. Limit vegetation clearing to that required for construction and safety and where possible, retain established trees and native shrub under storeys. Avoid the removal of trees with hollows (alive or dead). Where removal cannot be avoided, maintain the tree in tact (as far as possible) and place it on the ground in adjoining vegetation. Vegetation clearing methods shall be conducted in a manner that encourages natural regeneration of rootstock, minimises land disturbance and maintains soil stability and line clearance.

4.3.8 Weeds and Pest Management

Weeds & Pest Plants	
Objective	Avoid the spread of weeds and pest plants.
Legislation/Policy	*Native Vegetation Act 1991* *Native Vegetation Regulations 2003* *Environment Protection and Biodiversity Conservation Act 1999* *Natural Resources Management Act 2004* *National Parks and Wildlife Act 1972*
Potential Impacts	Potential spread of weeds and pest plants.
Mitigation	Any controlled weeds and pest plants within the existing pasture to be removed or destroyed prior to construction commencing. Should any controlled weeds or pest plants be identified, prevent their transmission by vehicles by cleaning vehicles before exiting the site. Any incoming or outgoing material will be checked for pest or weed species prior to being transported to and from the subject site. Locate equipment and materials storage areas in locations devoid of native vegetation. Ensure construction compounds are kept neat and tidy at all times. Ensure waste bins are emptied regularly, and covered where evidence of vermin exists. Replacement/rehabilitation of disturbed pasture immediately following construction works where appropriate.

4.3.9 *Fire Prevention and Protection*

Fire Prevention and Emergency Response Plan and Bushfire Mitigation Plan	
Objective	To reduce the risk of fire and prevent damage in the event of a bushfire.
Legislation/Policy	*Development Act, 1993* *Bushfire Emergency Services Act, 2005*
Potential Impacts	Damage to equipment and danger to life.
Mitigation	Fire risk is minimised through site selection, equipment design and maintenance measures. Adequate access to and within the site will be designed to assist CFS in responding and managing fires on site. Principal site access from Monarto Road and emergency access via Hillview Road. Communication and induction of local CFS prior to and during construction. Appropriate persons should be contacted as soon as practicable following detection of a fire, as detailed in the Incident Management Plan.

4.3.10 *Incident Management Plan*

Incident Management Plan	
Objective	To ensure that there is a procedure for managing and reporting incidents should they occur.
Legislation/Policy	*Work Health and Safety Regulations, 2012* *Work Health and Safety Act, 2012*
Potential Impacts	Reoccurrence of incidents if not managed effectively.
Mitigation	The general procedure to identify and address incidents if they occur is: - identify incident or non-conformance; - immediately rectify if safe to do so; - inform appropriate persons, including internal and external stakeholders; - complete incident register and determine appropriate corrective actions; and - implement corrective actions.

5.0 CEMP IMPLEMENTATION

5.1 Structure and Responsibilities

Whilst environmental management is the responsibility of everyone on the Project, various team members have specific roles in relation to environmental management. This section outlines the roles and responsibilities for key environmental personnel.

5.1.1 *Responsibilities*

Project Manager (PM)

The PM has the following particular responsibilities under this CEMP:

- communicate clear expectation in relation to environmental behaviour and performance to the Project team;
- ensuring that the requirements of this CEMP are fully implemented;
- reviewing environmental management reports and plans prepared by the Environment Manager;
- overall coordination and responsibility of dealing with issues and concerns and ensuring a record of all environment related complaints is maintained;
- ensuring that all Site Supervisors are familiar with the CEMP and their responsibilities contained within the plan; and
- delegating authority to act in the event of an emergency and to allocate the required resources.

Environment Manager

The Environment Manager has the following responsibilities under this CEMP:

- assist with the development, implementation and monitoring of the CEMP;
- liaison with relevant agencies and authorities;
- co-ordination of specialists as required;
- arranging necessary training of personnel into Project environmental matters;
- reviewing as required construction plans and method statements to check that adequate environmental management measures are incorporated into the planning of particular construction processes;
- establishing and maintaining this CEMP in accordance with the requirements of the contract and such that it complies with all applicable environmental regulations;
- ensuring reports are prepared and submitted to relevant authorities and Project personnel as required; and
- reporting on environmental performance to identified objectives and targets.

Site Supervisors and Foremen

The Site Foremen have the following responsibilities under this CEMP:

- ensure through the continual daily surveillance of the Project works that subcontractors and all personnel onsite comply with the requirements of the CEMP, plans and environmental procedures;
- have regard to weather conditions when programming daily works activities (for example vegetation removal, excavation works etc);

- report environmental incidents (actual/potential) to the Project Manager, and Environment Manager and assist in resolution;
- participate in any internal or external environmental inspections and audits if requested; and
- carry out maintenance on environmental controls as required.

Site Engineers

Site Engineers have the following responsibilities under this CEMP:

- preparation of work type/area specific procedures, Safe Work Method Statements, Vegetation Impact Permits and other relevant documentation in close liaison with the Environment Manager;
- ensuring that Foreman, Supervisors and sub-contractors are aware of the environmental procedures and the need to effectively implement the procedures;
- supervision of workforce and sub-contractors with respect to environmental compliance;
- monitoring and maintaining the works in conformance with the environmental procedures; and
- managing environmental incidents.

Other Personnel Including Sub-consultants and Subcontractors

Other personnel including sub-consultants and subcontractors have the following responsibilities under this CEMP:

- compliance with site induction requirements for all aspects of environmental management;
- compliance to the CEMP and all plans and procedures as they apply to their operations on the site;
- reporting all environmental incidents to the Foreman, Supervisor or Site/Project Engineer immediately; and
- following instructions issued by the Project team and supervisory personnel as they relate to environmental management and incidents.

5.2 Training, Awareness and Competence

Three main forms of training will be provided on site:

- site induction, including roles and responsibilities sheets - introduction to the project and assigned tasks regarding the CEMP;
- environmental awareness training – environmental awareness training will be tailored to the actual site and job description to allow personnel to complete assigned tasks regarding the CEMP; and
- "toolbox" training.

Records of induction and training will be kept on a database including the topic of the training carried out, dates, names and trainer details. Inductees will be required to sign-off that they have been informed of the environmental issues and that they understand their responsibilities. The Site Environmental Manager will review the program and monitor its implementation.

5.2.1 Environmental Inductions

Adequate training and instruction will be provided to all personnel to allow them to perform their duties whilst ensuring the environmental impacts associated with the Project are minimal.

The Project Manager will ensure all Pallamana Solar Farm (PSF) and subcontractor personnel attend an induction, prior to commencement of work.

There will be two levels of induction. Level one will be for visitors, irregular delivery drivers and others who will remain in the company of a fully inducted PSF employee. The level two induction will be required for all permanent employees and subcontractors working on the site. The level two induction will include but will not be limited to the following topics:

- the CEMP (purpose, objectives and key issues);
- legal requirements including applicable legislation, conditions of environmental licences, permits and approvals, due diligence, general environmental duty, and duty to notify and potential consequences of infringements;
- PSF environment policies;
- environmental management strategies and controls for areas such as erosion and sediment control, water discharge, waterway protection, clearing, fauna rescue, noise, refuelling and waste disposal;
- promoting awareness of significant environmental issues and personnel responsibilities (such as environmentally sensitive areas, limits of construction, identification of exclusion zones, cultural heritage issues etc);
- reporting of environmental incidents - which will include the type of events to be reported, how an event is reported and to whom the event is reported;
- emergency procedures - which will cover the procedure for an emergency and for evacuation of the site in the event of a catastrophic situation arising; and
- contingency plans – for example for 'hydrocarbon/chemical spills' and the 'discovery of previously unidentified aboriginal heritage sites'.

Questions pertaining to environment and heritage will be included in the site induction questionnaire to validate employees' understanding of the induction content.

5.2.2 *Environmental Awareness Training*

Staff and sub-contractors working on site will be provided with environmental training to achieve a level of awareness and competence appropriate to their assigned activities.

Targeted environmental awareness training will be provided to individuals or groups of workers with a specific authority or responsibility for environmental management or those undertaking an activity with a high risk of environmental impact. This training will generally be prepared and delivered by the Site Environmental Manager. TCWF environmental staff and Project environmental specialists may also deliver specific environmental training.

5.2.3 *Toolbox Training*

A set of toolbox topics will be devised as training a tool for presentation at toolbox meetings to raise awareness of environmental aspects and issues associated with construction projects. Each topic consists of a five minute information poster/presentation, and discussion session.

Toolbox training will help to ensure that relevant information is communicated to the workforce and that feedback can be provided on issues of interest or concern. Toolbox training will generally be prepared and delivered by the Site Environmental and Quality Manager, Project Engineers or Site Foreman.

Topics covered include erosion and sediment control, dust, waste management, hydrocarbons, flora/fauna, and any other Project-specific issues such as the efficient use of plant and materials; noise and vibration minimisation; protecting waterways and riparian zones; wastewater control; work methods; management of contaminated soil; and general site issues.

5.2.4 *Hours of Work*

The following hours of work will comply with those in the South Australian EPA Guidelines for Noise from Industry in Regional SA:

- Monday to Saturday 7:00 am to 7:00 pm; and
- Sunday – nil.

6.0 CHECKING AND CORRECTIVE ACTION

A systematic monitoring and measuring process involving inspection and testing fulfils a threefold purpose to:

- ensure conformity to contractual requirements;
- ensure environmental performance complies with legislative requirements and in accordance with Project requirements; and
- provide an ongoing risk management process and early warnings of hazards.

Environmental monitoring and reporting process on this Project shall include:

- monitoring;
- inspections;
- auditing; and
- reporting.

Project team personnel including the Environment Manager, Site/Project Engineers and Foremen and Site Supervisors, are responsible for undertaking daily monitoring of the Project as well as being involved in formal environmental inspections.

The Environment Manager shall review all sustainability and environmental monitoring results, non-compliance and corrective and preventative actions as they are produced/occur.

Any results outside of relevant limits/targets shall be reported immediately to the Project Manager, who shall take appropriate action and advise appropriate personnel and authorities.

6.1 Internal Inspections/Monitoring

Environmental monitoring programs for water quality, noise, site discharges, as well as matters relating to flora and fauna and heritage, etc. are addressed in sub plans. Additional monitoring may also be required under specific work packages. Each environmental monitoring program includes details on the proposed timing, frequency, locations and responsibility of monitoring and actioning systems so that environmental monitoring information is used to resolve identified problems effectively and quickly. This includes measures for prompt use of monitoring information by Project staff and identification of Project environmental exceedance levels and proposed corrective action and timing to address exceedances.

Further, an Environmental Inspection Checklist will be completed by the Environmental Manager for documenting weekly site inspections for the purpose of verifying compliance with the CEMP, licences, permits and approvals.

Where inspection by the Site Environmental Manager or delegate determines that measures are not effective the Project will implement corrective and preventative measures.

6.2 Control of Measuring and Testing Equipment

All inspection, measuring and testing equipment (including newly acquired test equipment) used for inspection and acceptance purposes shall be controlled, calibrated and maintained, as per the relevant manufacturer's specifications. This also includes such equipment used by sub-contractors.

Measuring equipment for inspection and product conformance purposes shall be calibrated at prescribed intervals against certified equipment having a known relationship to nationally recognised standards. Any equipment identified as having doubtful accuracy or precision shall be removed from use and calibrated. Where any inspection, measuring and test equipment is found to be out of calibration, the validity of the previous inspection results shall be assessed and documented.

6.3 Reporting

The Environment Manager is responsible for reporting on the environmental performance of the Project. All formal reports shall be approved by the Project Manager prior to distribution.

6.3.1 Weekly Environmental Reports

The Environment Manager shall record environmental inspections on the environmental inspection checklist and report any environmental observations, trends, observations, improvements, requests, corrections and upcoming events and activities verbally through the weekly construction meeting.

6.3.2 Monthly Environmental Reports

A written environment report each month shall be compiled by the Environment Manager and included in the Project monthly reporting containing information such as:

- a status of environmental activities such as monitoring and surveillance of controls, inspections, testing and incidents associated with the work during the preceding month;
- environmental good news stories;
- complaints, infringements and penalties incurred;
- all environmental incidents;
- status of environment implementation and document preparation/approval;
- status of all non-conformances, detailing preventative actions taken to prevent reoccurrence of those incidents/non-conformances; and
- the results of environment reviews and audits (internal and external) undertaken during the preceding month.

6.4 Auditing

6.4.1 Internal Audits and Inspections

Internal audits will be completed within the first three months of start-up and thereafter every six months (as a minimum). An audit report register shall be maintained. Internal environmental audits shall include:

- internal audits to ensure implementation of the Project environmental processes; and
- regular surveillance during the construction phase and ensure independent three monthly audits.

Results of the audit shall be documented and brought to the attention of the personnel having responsibility for the area audited and reported to the Project Manager within five working days of finalisation of the audit. For any observations or non-compliances found, corrective actions shall be recorded in the Environmental Inspection Checklist and addressed in a timely manner.

6.4.2 External Audits and Inspections

External (independent) audits will be undertaken three months from the commencement of construction and then at twelve monthly intervals. All external audits will be undertaken in accordance with *ISO 19011:2003 - Guidelines for Quality and/or Environmental Management Systems Auditing.*

Results from external audits are to be reviewed by the Project Manager and any necessary corrective actions assigned to ensure appropriate and timely closeout.

6.5 Incident and Non-Conformity

An incident can be defined as an unwanted event which has an adverse effect on the environment. A non-conformance can be defined as a failure to undertake a task in the required manner. This may not lead to an incident, and if this is the case may be considered a near miss.

The manner in which tasks are required be completed is detailed in various Project plans, legislation, Project quality systems, etc.

The incident register must be completed by parties involved in the incident or non-conformance within 24 hours, once immediate required mitigation actions are completed.

This process must include an investigation or review of the incident to identify any further appropriate corrective actions required. Completed incident report forms must be signed by those documenting the report as well as by the Construction or Operations Manager.

6.6 Implement Corrective Actions

Corrective actions identified in the incident investigation and review should be implemented as soon as practicable, undertaken or overseen by the responsible party as listed in the incident register.

6.7 Complaints

Complaints from any source (for example, public or government authorities) relating to the environment will be registered using a complaint report and the complaint investigated by the Environmental Manager in consultation with the Project Manager and actions will be taken to enable satisfactory closeout.

An environmental complaints register will be established and maintained by the Environmental Manager who will receive, log, track and respond to complaints within 24 hours. In the case of an emergency, potential pollution/environmental incident or non-compliance, the complaint will be responded to immediately.

The following details will be recorded in the register:

- date and time;
- type of communication (telephone, letter, meeting etc);
- name, address, contact number of complainant;
- nature of complaint;
- action taken in response including who the complaint was referred to (if not resolved immediately); and
- details of any monitoring undertaken to confirm that the complaint has been satisfactorily resolved.

6.8 Emergency Preparedness and Response

Appropriate persons should be contacted as soon as practicable following detection of an incident. This includes but is not limited to those listed in the below table.

Table 2 – Emergency Contact Details

Contact	Phone Number
Pallamana Solar Farm Supervisor	To be determined
Police	131 444 / 000
CFS	000
Ambulance	000
Rural City of Murray Bridge	08 8539 1100
Environmental Protection Agency	08 8204 2004
Wildlife SA	0402 734 555

6.9 Document of Records

Project records, including pertinent subcontractor Project records, shall be maintained to provide evidence of the effective operation of the environmental management system. Such records shall include, but are not limited to:

- correspondence to/from interested parties;
- permits, licenses and approvals;
- induction register and induction training records;
- environmental incidents, non-conformances and complaints;
- inspection reports, checklists, diary entries;
- monitoring results;
- cultural heritage activities;
- waste measurement and tracking records;
- internal and external inspections and audits; and
- any other record identified within the CEMP.

7.0 REVIEW AND CONTINUOUS IMPROVEMENT

This CEMP shall be reviewed every six months or in response to a major environmental incident by the Environment Manager with assistance from the project team. It shall be updated accordingly, and any changes to it shall be communicated to the project team and maintained in a document control register. if any of these changes are to impact the construction staff, they shall be informed of the relevant changes during a toolbox talk.