



Construction Environmental Management Plan (CEMP) Broken Hill Solar PV Power Station



Table of Contents

1	Purpose	15
2	Scope.....	15
	2.1 First Solar Scope of Work	15
	2.2 CEMP Scope	16
3	CEMP Context	17
	3.1 Approval Process	17
	3.2 CEMP Approval Conditions.....	18
	3.3 Project Approval Documents.....	19
	3.4 First Solar Environmental Policy	19
4	Project Location and Description.....	20
	4.1 Overview.....	20
	4.2 Location	20
	4.3 Broken Hill Solar PV Power Station Development	20
5	CEMP Development	22
	5.1 CEMP Structure	22
	5.2 CEMP Project Approval Conditions.....	23
	5.3 Approval and Licensing Requirements	25
6	Construction Activities	26
	6.1 Program	26
	6.2 Construction Sequence.....	26
	6.3 Construction Activities and Duration.....	26
	6.4 Construction Site Layout.....	28
	6.5 Construction Water Supply.....	30
	6.5.1 Requirements and Description.....	30
	6.5.2 Consultation with Broken Hill City Council (BHCC).....	33
	6.6 Utilities and Services.....	33
7	Cumulative Impacts	34



7.1	Local Services.....	34
7.2	Other Construction Projects.....	34
8	Environmental Management.....	35
8.1	Environmental Management Structure.....	35
8.2	Construction Roles and Responsibilities.....	36
8.2.1	<i>First Solar</i>	36
8.2.2	<i>Project Environmental Representative</i>	37
8.3	Reporting.....	38
8.4	Environmental Training.....	39
8.5	Emergency Contacts and Response.....	39
9	Implementation.....	41
9.1	Risk Assessment of Construction Activities.....	41
9.2	Natural Hazard Management.....	42
9.2.1	<i>Bushfire</i>	42
9.2.2	<i>Flood risk</i>	43
9.3	Aboriginal Heritage.....	44
9.4	Environmental Management Activities and Controls.....	44
9.5	Condition C3 CEMP Sub-plans.....	50
9.6	General Condition CEMP Sub-plans.....	51
10	Soil and Water Management.....	52
10.1	Purpose.....	52
10.2	Background.....	52
10.2.1	<i>Geology and Soils</i>	52
10.2.2	<i>Hydrology Assessment</i>	52
10.3	Construction Staging.....	53
10.3.1	<i>Overview</i>	53
10.3.2	<i>Site Preparation</i>	54
10.4	Onsite SWMP Management.....	57
10.4.1	<i>Principles</i>	57

10.4.2	<i>SWMP Awareness</i>	57
10.5	Land Disturbance.....	58
10.5.1	<i>Extent of Disturbance</i>	58
10.5.2	<i>Cut/fill</i>	59
10.5.3	<i>Topsoil and Stockpile Management</i>	59
10.5.4	<i>Stabilisation</i>	60
10.5.5	<i>Erosion Control and Stormwater Management</i>	61
10.5.6	<i>Sediment Control</i>	61
10.6	Water.....	62
10.6.1	<i>Construction Water</i>	62
10.6.2	<i>Flooding and Waterways</i>	62
10.6.3	<i>Proposed Site Drainage</i>	63
10.6.4	<i>Groundwater Resources</i>	64
10.7	Site Inspection and Maintenance	64
10.8	Responsibilities	65
10.9	Records	66
10.10	Soil and Water Management Drawings.....	66
11	Rehabilitation and Revegetation Management.....	67
11.1	Objectives	67
11.2	Approval Conditions, Commitments and Plan Interfaces.....	67
11.3	Environmental Context.....	68
11.3.1	<i>Revegetation</i>	68
11.3.2	<i>Rehabilitation</i>	68
11.4	Impact Footprint Revegetation	69
11.4.1	<i>Construction Areas</i>	69
11.4.2	<i>Revegetation and Rehabilitation Strategy</i>	70
11.4.3	<i>Active Restoration</i>	70
11.5	<i>Natural Regeneration</i>	71
11.6	<i>Recommended Procedure</i>	71
11.7	Areas of Outside of the Impact Footprint.....	72
11.8	Monitoring.....	72

11.9	Responsibilities	73
11.10	Records	73
12	Historical Heritage Management Plan	74
12.1	Objectives	74
12.2	EIS Context.....	74
12.3	Actions	75
12.3.1	<i>Procedures for Dealing with Unidentified Objects.....</i>	<i>75</i>
12.3.2	<i>Procedures for Dealing with Suspected Human Remains.....</i>	<i>75</i>
12.3.3	<i>Historical Heritage Induction Processes for Construction Personnel.....</i>	<i>75</i>
12.3.4	<i>Responsibilities</i>	<i>76</i>
12.4	Records	76
13	Dust and Air Quality Management	77
13.1	Objectives	77
13.2	Environmental Assessment Context.....	77
13.3	Dust Control Strategy	78
13.3.1	<i>Overview.....</i>	<i>78</i>
13.3.2	<i>Dust Generation Sources</i>	<i>78</i>
13.3.3	<i>Control Strategy.....</i>	<i>78</i>
13.3.4	<i>Construction Water Supply.....</i>	<i>79</i>
13.4	Dust Suppression Measures	79
13.4.1	<i>Traffic Generated Dust</i>	<i>79</i>
13.4.2	<i>Construction Activities.....</i>	<i>80</i>
13.4.3	<i>Vehicle/machinery Emissions and Loads</i>	<i>80</i>
13.4.4	<i>Burning</i>	<i>80</i>
13.5	Corrective Actions	81
13.5.1	<i>Visible Emissions of Dust from the Site.....</i>	<i>81</i>
13.5.2	<i>Complaints Procedure.....</i>	<i>81</i>
13.6	Monitoring.....	81
13.7	Responsibilities	82
	<i>Site Construction Manager.....</i>	<i>82</i>
	<i>Site Environmental Advisor</i>	<i>82</i>

	<i>Supervisors</i>	83
	<i>Construction Personnel</i>	83
	13.8 Records	83
14	Dangerous Goods and Spill Response.....	84
	14.1 Purpose.....	84
	14.2 Standards and Guidelines	84
	14.3 Dangerous Goods and Hazardous Materials	85
	14.3.1 <i>Types, Uses and Classification</i>	85
	14.3.2 <i>Storage</i>	86
	14.3.3 <i>Handling</i>	87
	14.4 Spill and Emergency Response	89
	14.4.1 <i>Spill</i>	89
	14.4.2 <i>Emergency</i>	91
	14.5 Responsibilities	91
	<i>AGL Project Manager</i>	91
	<i>First Solar Site Project Manager</i>	91
	<i>First Solar Site Construction Manager</i>	91
	<i>First Solar Site Environmental Advisor</i>	92
	<i>First Solar Site Supervisors</i>	92
	<i>Construction Personnel</i>	93
	14.6 Records	93
15	Waste Management	94
	15.1 Objectives	94
	15.2 Broken Hill City Council Landfill and Waste Depot	94
	15.3 Waste Types	95
	15.3.1 <i>Overview</i>	95
	15.3.2 <i>Waste Types and Disposal</i>	95
	15.3.3 <i>External Waste</i>	95
	15.4 Waste Management	99
	15.4.1 <i>General Wastes</i>	99
	15.4.2 <i>Spoil Management</i>	100



15.4.3	<i>Liquid Waste Management</i>	100
15.4.4	<i>Hazardous Wastes</i>	100
15.4.5	<i>Demobilisation Waste Removal</i>	101
15.5	<i>Responsibilities</i>	101
	<i>Site Construction Manager</i>	101
	<i>Site Environmental Advisor</i>	101
	<i>Supervisors</i>	102
	<i>Construction Personnel</i>	102
15.6	<i>Records</i>	102
16	<i>Bushfire Management</i>	103
16.1	<i>Objectives</i>	103
16.2	<i>Scope</i>	103
16.2.1	<i>Overview</i>	103
16.2.2	<i>Background</i>	104
16.3	<i>Design</i>	104
16.4	<i>Mitigation Measures</i>	105
16.5	<i>Preventative Actions</i>	106
16.5.1	<i>Constantly Monitor and Advise Fire Danger Status</i>	106
16.5.2	<i>Adhere to Total Fire Ban rules</i>	106
16.5.3	<i>No Intentionally Lit Fires for Any Purpose</i>	106
16.5.4	<i>Extinguish and/or Contain When Safe To Do So</i>	106
16.5.5	<i>Storage of Fuel and Combustibles</i>	107
16.5.6	<i>Specific Controls</i>	108
16.5.7	<i>Inspections and Monitoring</i>	109
16.6	<i>Consultation</i>	109
16.6.1	<i>NSW Rural Fire Service (RFS)</i>	109
16.6.2	<i>Broken Hill Fire Station</i>	110
16.6.3	<i>Fire Fighting Service Access</i>	110
16.7	<i>Emergency Evacuation</i>	110
16.8	<i>Objectives</i>	111
16.9	<i>Responsibilities</i>	111
	<i>Project Manager</i>	111

	<i>Construction Manager</i>	111
	<i>Site Health and Safety Manager / Site Environmental Advisor</i>	111
	<i>Supervisors</i>	112
	<i>Construction Personnel</i>	112
	16.10 <i>Records</i>	112
17	<i>Community Consultation</i>	113
	17.1 <i>Scope</i>	113
	17.2 <i>Specific Consultation Conditions</i>	113
	17.3 <i>Actions</i>	113
	17.3.1 <i>Provision of Electronic Information</i>	113
	17.3.2 <i>Community Information Plan</i>	114
	17.3.3 <i>Key Stakeholders</i>	114
	17.3.4 <i>Complaints Procedure</i>	114
18	<i>Environmental Management Schedules</i>	116
	18.1 <i>Plan Schedules</i>	116
	18.2 <i>Sub-plan Environmental Management Schedules</i>	117
	18.3 <i>First Solar HSE ‘Intelex’ System</i>	117
19	<i>Agency Consultation for CEMP Development</i>	118
20	<i>Environmental Performance</i>	121
	20.1 <i>Objectives and Targets</i>	121
	20.2 <i>Inspections and Monitoring</i>	123
	20.2.1 <i>Weekly site inspections</i>	123
	20.2.2 <i>Environmental Representative (ER) Inspections</i>	123
	20.2.3 <i>Environmental monitoring</i>	124
	20.3 <i>Audit and Review</i>	124
	20.3.1 <i>Purpose</i>	124
	20.3.2 <i>CEMP audits</i>	124
	20.3.3 <i>CEMP review</i>	125
	20.4 <i>Corrective Actions</i>	126
	20.5 <i>Incident Management</i>	127
	20.5.1 <i>Notification reporting requirements</i>	127



20.5.2	<i>Environmental incidents process</i>	127
20.5.3	<i>Emergency environmental incident</i>	129
20.5.4	<i>Incident report</i>	129
20.5.5	<i>Records</i>	129
20.6	Compliance Tracking Program	130
21	Complaints Handling Procedure	131
21.1	Purpose	131
21.2	Methods to Receive Complaints	131
21.3	Complaints Management Process	131
21.4	Verbal Complaints Received by Construction Personnel	133
22	References	134
	CEMP Attachments	135
	Sub-plan A – Flora and Fauna Management Plan	136
	Sub-plan B – Ground Cover Management Plan	137
	Sub-plan C – Landscape Plan	138
	Sub-plan D – Construction Noise Management Plan	139
	Sub-plan E – Construction Traffic Management Plan	140
	Sub-plan F – Aboriginal Heritage Management Plan	141
	Appendices	142
	Appendix A – Conditions and Commitments to CEMP Map	143
	Appendix B – First Solar Health, Safety and Environmental Policy	144
	Appendix C – Worker Environmental Awareness and Compliance Training (WEAC)	145
	Appendix D – Register of Construction Hazards and Environmental Risk Assessment	146
	Appendix E – Civil Drawings	147
	Appendix F – CEMP Environmental Management Schedules (forms, reports and registers)	148
	Appendix G – Agency Consultation	149

List of Tables

Table 1: Cross Reference to C2 and C3 Project Approval Conditions.....	23
Table 2: Construction Activities and Expected Duration	27
Table 3: Provision of Services to the Project Site.....	34
Table 4: Environmental Management Activities –Broken Hill Solar PV Power Station.....	45
Table 5: Condition C3 Sub-plans, Approval Conditions and References	50
Table 6: General Condition Sub-plans, Approval Conditions and References.....	51
Table 7: Work Limitations	59
Table 8: Indicative List of Dangerous Goods to be used during Construction.....	85
Table 9: Indicative List of Combustible Liquids to be used during Construction	85
Table 10: Waste Types and Management	96
Table 11: Identification and Control of Bushfire Risks, Broken Hill Solar PV Power Station	105
Table 12: CEMP Environmental Management Schedules	116
Table 13: List of Sub-plan Environmental Management Schedules	117
Table 14: Stakeholders and Relevant CEMP Sections	118
Table 15: Summary of Consultation undertaken with Government Stakeholders	119
Table 16: CEMP Objectives and Targets	121
Table 17: Agency Reporting Requirements	127
Table 18: Compliance Tracking Program	130

List of Figures

Figure 1: Site Layout – ABH1 C100.....	29
Figure 2: Layout Map showing the Proposed Pipeline Route, as supplied by AGL.....	31
Figure 3: Location of Construction Water Pond – ABH1 C800	32
Figure 4: Environmental Management Structure	35
Figure 5: Cut/Fill Model – ABH1 FG15	56
Figure 6: Typical downstream culvert detail	64
Figure 7: Vegetation communities at the Broken Hill site	69
Figure 8: Environmental Incident	128

CEMP Attachments

Sub-plan A – Flora and Fauna Management Plan

Sub-plan B – Ground Cover Management Plan

Sub-plan C – Landscape Plan

Sub-plan D – Construction Noise Management Plan

Sub-plan E – Construction Traffic Management Plan

Sub-plan F – Aboriginal Heritage Management Plan

Appendices

Appendix A – Conditions and Commitments to CEMP Map

Appendix B – First Solar Health, Safety and Environmental Policy

Appendix C – Worker Environmental Awareness and Compliance Training (WEAC)

Appendix D – Register of Construction Hazards and Environmental Risk Assessment

Appendix E – Civil Drawings

Appendix F – CEMP Environmental Management Schedules (forms, reports and registers)

Appendix G – Agency Consultation

Document Control

Doc Rev	Date	Reason	Review		Issued by	Review	
			Initials	Date		Initials	Date
A	30-04-14	Issued for First Solar Review	MV	30-04-14	Beca Pty Ltd	TG	20-05-14
B	15-05-14	Issued for AGL Review	na	na	Beca Pty Ltd	MW	30-05-14
0	30-05-14	Final CEMP	SA	30-05-14	Beca Pty Ltd	MW	03-06-14 13-06-14
1	20-06-14	Final CEMP updated to address ER comments	SA	01-07-14	Beca Pty Ltd	na	na
2	27-08-14	Response to DPI comments	TG/JM	27-08-14	First Solar	TG	27-08-14
3	26-09-14	Amendments to TMP & Drainage plans & RMS approval	TG/JM	26-09-14	First Solar	TG	26-09-14

Document Author: Shelley Anderson
Associate Environmental Scientist
Beca Pty Ltd (Beca)

Document Owner: Warren Woo
Project Manager
First Solar (Australia) Pty Ltd (First Solar)

Acknowledgements:

First Solar: Template CEMP documents



Abbreviations and Glossary

Abbreviation/term	Description
AGL / Proponent	AGL Energy Limited
ARI	Average Recurrence Interval
CEI	Australian Government Clean Energy Initiative
CEMP	Construction Environmental Management Plan
Council	Broken Hill City Council
SCC	Site Control Centre
CWD	Coarse Woody Debris
dB	Decibel
DEMP	Decommissioning Environmental Management Plan
DIPNR (2004)	DIPNR (2004) <i>Guideline for the Preparation of Environmental Management Plans</i> . Department of Infrastructure, Planning and Natural Resources
DoPI	NSW Department of Planning and Infrastructure (the Department)
EA	Environmental Assessment
EEC	Endangered Ecological Community
EPC	Engineering, Procurement and Construction
First Solar	First Solar (Australia) Pty Ltd
Ha	Hectare
HSE	Health, Safety and Environment
Km	Kilometre
kV	Kilovolt
m	Metre
MW	Megawatt
MWh	Megawatt hours
OEMP	Operational Environmental Management Plan

Abbreviation/term	Description
OEH	NSW Office of Environment and Heritage
O&M	Operations and Maintenance
PV	Photovoltaic
PVCS	Photovoltaic Combining Switchgear
RFS	NSW Rural Fire Service
RMS	Roads and Maritime Services
SKM (2012) Environmental Assessment	SKM (2012) <i>Broken Hill Solar Plant Environmental Assessment</i>
Solar Plant	Broken Hill Solar PV Power Station
SPPR	Submissions and Preferred Project Report
WEAC Training	Worker Environmental Awareness and Compliance Training
Willyama Common	The Common

1 Purpose

This Construction Environmental Management Plan (CEMP) has been prepared for the Broken Hill Solar Photovoltaic (PV) Power Station Project, located approximately five kilometres south west of Broken Hill city.

This CEMP has been prepared in accordance with First Solar's and AGL's environmental policies to demonstrate how the Project will comply with the Approval Conditions (MP10_0202) relating to construction of the power station. The overarching goal is described by Condition A1, *the proponent shall implement all reasonable and feasible measures to prevent and/or minimise any harm to the environment that may result from the construction, operation or decommissioning of the Project.*

The Project Approval Conditions C2 and C3 list specific elements that must be addressed in this CEMP. Other conditions relevant to the construction phase are also addressed.

The purpose of this CEMP is to mitigate and monitor the potential environmental effects identified by the Environmental Assessment (SKM, 2012) and submissions stages of the approval application, and subsequently included in the Project Approval Conditions. Specific commitments relevant to the construction phase have also been addressed in this CEMP.

2 Scope

2.1 First Solar Scope of Work

First Solar (Australia) Pty Ltd (First Solar) has been contracted by AGL Energy Limited (AGL) to provide engineering, procurement and construction (EPC) services for the design and construction of the Broken Hill Solar PV Power Station (including ancillary facilities and utilities and services potentially affected by their works). Therefore, First Solar has developed this CEMP to address those construction works within the scope of First Solar's contract with AGL.

The First Solar works are to construct the Solar PV power station, comprising the following:

- A PV array incorporating rows of solar panels mounted on a fixed steel frame and a series of central inverters and transformers
- Above ground and underground electrical conduits and cabling to connect the arrays to the inverters and transformers
- Photovoltaic combining switchgear (PVCS) to collect the power from the PV arrays
- Access, perimeter and internal roads
- Fencing and landscaping, pond for construction water (incl. dust control) and sediment fences

- Operations and maintenance (O&M) building, Site Control Centre (SCC) and guard shack
- Temporary construction facilities such as a construction offices and parking, turnaround area, secured construction laydown area.

2.2 CEMP Scope

This CEMP has been prepared to meet the requirements of the Project Approval (Application Number MP10_0202). In particular, this CEMP addresses Conditions C2 and C3 (Environmental Management – Construction Environmental Management Plan). Appendix A provides a cross reference of all Project Approval Conditions and Commitments to this CEMP and Sub-plans.

This CEMP has been written in accordance with the *Guideline for the Preparation of Environmental Management Plans* (Department of Infrastructure, Planning and Natural Resources (DIPNR), 2004).

The CEMP has been developed to:

- Describe the implementation of the project Environmental Assessment (EA), including the Project Approval Conditions and the Mitigation Measures
- Ensure that the project complies with environmental legislation
- Manage environmental risks associated with the construction of the power station
- Apply environmental best practice during the construction of the power station.

A second CEMP is being prepared for the power station grid connection by a separate contractor. The grid connection for the Broken Hill Solar PV Power Station is not under the mandate of First Solar and is therefore not included in this CEMP. Please refer to the separate grid connection/transmission line CEMP for information specific to the grid connection construction works.

3 CEMP Context

3.1 Approval Process

AGL (the Proponent) sought project approval under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to construct and operate the Broken Hill Solar Plant (Part 3A has since been repealed). At this time, the Minister for Planning and Infrastructure was the approval authority.

The project was assessed as a major project being development for the purpose of a facility for the generation of electricity or heat or their cogeneration (using any energy source, including gas, coal, bio-fuel, distillate and waste hydro, wave, solar or wind power) that has a capital investment value of more than \$30 million.

On the 14th of September 2011, the Minister for Planning and Infrastructure delegated the approval functions to the Planning Assessment Commission (PAC) under Section 75J of the EP&A Act.

The project was classified as critical infrastructure on the grounds of relating to the generation of electricity derived from renewable fuel sources being development with capacity to generate at least 30 MW. In terms of permissibility, the proposed solar plant is located in the unincorporated area administered by the NSW Department of Primary Industries, Catchments and Lands Division and therefore, local planning instruments are not applicable.

A project Environmental Assessment (October 2012) was prepared by SKM for AGL (SKM (2012) Environmental Assessment). The Environmental Assessment was placed on public exhibition between Monday 29 October 2012 and Friday 30 November 2012.

Six submissions were received from public authorities:

- Office of Environment and Heritage (OEH)
- Roads and Maritime Services (RMS)
- Department of Primary Industries (DPI) – Crown Land and NSW Office of Water (NOW)
- Broken Hill City Council (Council)
- Environmental Protection Authority (EPA) – no objections or comments on the project
- Trade and Investment – Resources and Energy – no concerns regarding project and mineral resources.

No public submissions were received. A late submission was received from NTSCORP regarding a native title claim on the project area.

The Proponent provided a response to the issues raised in the Submissions and Preferred Project Report (SPPR) (7 February 2013). The response included changes as part of ongoing engineering design and measures to reduce environmental impacts.

The Department of Planning and Infrastructure (DoPI, the Department) issued the Environmental Assessment Report in March 2013 and recommended that the project be approved subject to the Proponent's Statement of Commitments and the Department's recommended conditions.

The Planning and Assessment Commission (PAC) issued the final determination of the Broken Hill Solar Plant application on the 27 March 2013. This determination agreed with the Department's decision and approved the application subject to the recommended conditions.

The Minister for Planning and Infrastructure issued the Instrument of Approval on 27 March 2013, which includes the approval conditions relating to development of a Construction Environmental Management Plan (CEMP). These conditions are discussed in the following sections.

3.2 CEMP Approval Conditions

The conditions for the Broken Hill Solar PV Power Station relevant to this Construction Environmental Management Plan (CEMP) are listed in Schedule 2 of the Project Approval (Application Number MP_0202).

Schedule 2 Part C *Environmental Management, Reporting and Auditing Condition C2 Construction Environmental Management Plan*, describes the requirements for the preparation and implementation of the CEMP and Condition C3 prescribes the preparation and implementation of specific Sub-plans as listed below:

- Flora and Fauna Management Plan
- Ground Cover Management Plan
- Landscape Plan
- Construction Noise Management Plan
- Traffic Management Plan
- Aboriginal Heritage Plan.

3.3 Project Approval Documents

In accordance with Condition A2 of the Project Approval, First Solar has developed this CEMP on the basis of the requirements set out in the following documents:

- Project Approval (Application No. MP10_2020)
- Broken Hill Solar Plant Environmental Assessment prepared by Sinclair Knight Merz dated October 2012 (SKM, 2012)
- Broken Hill Solar Plant Submissions and Preferred Project Report prepared by Sinclair Knight Merz dated February 2013 (SKM, 2013)
- Conditions contained within Project Approval (Application No. MP10_0202).

Additionally, First Solar has developed the First Solar CEMP to be consistent with the AGL CEMP Staging Document.

Condition A12 of the Project Approval specifies that the Proponent shall ensure that employees, contractors and sub-contractors are aware of, and comply with the conditions of the Project Approval, relevant to their respective activities.

The same approach will be applied by First Solar with regard to its scope of work, employees, contractors and sub-contractors.

3.4 First Solar Environmental Policy

First Solar (Australia) Pty Ltd has a combined Health, Safety and Environmental Policy. First Solar's Health, Safety and Environmental Policy is provided in Appendix B.

4 Project Location and Description

4.1 Overview

The Broken Hill Solar PV Power Station forms part of the Australian Government's Solar Flagships Program. The Solar Flagships Program is part of the Australian Government's Clean Energy Initiative (CEI). As part of the Flagships Program, AGL Energy Limited (AGL) will deliver the 53.76 megawatt (MW) solar photovoltaic (PV) power station at Broken Hill (NSW).

First Solar (Australia) Pty Ltd has been engaged by AGL as the main Engineering, Procurement and Construction (EPC) contractor for the design, supply, construction and commissioning of the Broken Hill Solar PV Power Station.

4.2 Location

The Broken Hill Solar PV Power Station will consist of a 53.76 MW solar PV power station located approximately 5 km south west of Broken Hill. The solar plant will occupy one land holding of approximately 200 ha.

The project site is Crown Land administered by the NSW Department of Primary Industries, Catchment and Lands Division. The local area is characterised by mineral processing, Crown Lands, rural activities and the Willyama Common (being public land which covers approximately 97 km²).

4.3 Broken Hill Solar PV Power Station Development

The Broken Hill Solar PV Power Station will utilise First Solar's advanced cadmium telluride (CdTe) thin film photovoltaic modules. The solar modules generate electricity with no air emissions, no waste production, no water use and have one of the smallest carbon footprints of any current PV technology. Over 7,000 MW of First Solar PV modules have been installed worldwide, including at many of the world's largest solar PV plants, since beginning commercial production in 2002. First Solar has been actively involved in the Australian market since mid-2008.

The construction of the Broken Hill Solar PV Power Station project is expected to commence in mid-2014 and will take approximately 17 – 18 months to complete. Once operational, the Broken Hill Solar PV Power Station will generate an estimated 117,000 megawatt hours (MWh) of electricity annually.

The Broken Hill Solar PV Power Station development will include:

- 40 blocks of PV arrays with a total of approximately 0.65 million cadmium telluride (CdTe) thin film PV modules
- Aboveground and underground electrical cabling to connect the PV arrays to central inverters and transformers
- Marshalling switchgear to collect the power from PV arrays

- Diversion of the existing 22 kV aboveground transmission line and placing it underground
- An operations and maintenance building and amenities
- Access road, internal roads and parking
- Fencing and landscaping around the site.
- Temporary construction facilities such as a site compound and equipment laydown area.

The power station will be connected to the grid via a new overhead transmission line, approximately 2.7 km in length. The transmission line will connect the onsite Broken Hill Solar PV Power Station substation into the existing TransGrid Broken Hill substation. The existing 1.3 km 22 kV overhead transmission line that traverses the site would be diverted underground around the solar plant. The transmission line diversion and the transmission line to the Broken Hill substation will be constructed by a separate EPC Contractor commissioned by AGL.

5 CEMP Development

5.1 CEMP Structure

The development of this CEMP document was guided by the DIPNR (2004) *Guideline for the Preparation of Environmental Management Plans* and environmental management plans developed for First Solar's Solar PV Power Station at Nyngan NSW (currently under construction).

This CEMP comprises:

- Overarching CEMP document:
 - Format in accordance with DIPNR (2004)
 - Project Approval Condition C2.
- Environmental management Sub-plans for specific issues:
 - Project Approval Condition C3 Sub-plans
 - Project Approval General Conditions Sub-plans.
- CEMP appendices
 - Policies
 - Procedural management plans (e.g. Worker Environmental Awareness and Compliance Training and Complaints, WEAC)
 - Environmental schedules, inspections and checklists
 - Agency consultation records.

5.2 CEMP Project Approval Conditions

Table 1 below lists each of the items listed under Approval Conditions C2 and C3 and references to relevant sections in this CEMP.

Table 1: Cross Reference to C2 and C3 Project Approval Conditions

Condition	Condition description	CEMP section
C2	(a) a description of all relevant activities to be undertaken on the site during construction including an indication of stages of construction, where relevant	<ul style="list-style-type: none"> Section 6 Construction Activities
C2	(b) identification of the potential for cumulative impacts with other construction activities occurring in the vicinity and how such impacts would be managed	<ul style="list-style-type: none"> Section 7 Cumulative Impacts
C2	(c) details of any construction sites and mitigation, monitoring, management and rehabilitation measures specific to the site compound(s) that would be implemented	<ul style="list-style-type: none"> Section 9 Implementation Sections 10 – 16
C2	(d) statutory and other obligations that the Proponent is required to fulfill during construction including all relevant approvals, consultations and agreements required from authorities and other stakeholders, and key legislation and policies	<ul style="list-style-type: none"> Section 5.3 Approval and Licensing Requirements
C2	(e) evidence of consultation with relevant public authorities required under this condition and how issues raised by the agencies have been addressed in the plan	<ul style="list-style-type: none"> Section 19 Agency Consultation
C2	(f) a description of the roles and responsibilities for all relevant employees involved in the construction of the project including relevant training and induction provisions for ensuring that all employees, contractors and sub-contractors are aware of their environmental and compliance obligations under these conditions of approval	<ul style="list-style-type: none"> Section 8 Environmental Management
C2	(g) details of how the environmental performance of construction will be monitored, and what actions will be taken to address identified potential adverse environmental impacts	<ul style="list-style-type: none"> Section 20 Environmental Performance
C2	(h) specific consideration of relevant measures identified in the documents referred to under conditions A2b) and A2c) of this approval	<ul style="list-style-type: none"> Section 9 Implementation

Condition	Condition description	CEMP section
	<p>A2. The Proponent shall carry out the project generally in accordance with the:</p> <ul style="list-style-type: none"> • b) Broken Hill Solar Plant Environmental Assessment prepared by Sinclair Knight Merz dated October 2012 • c) Broken Hill Solar Plant Submissions and Preferred Project Report prepared by Sinclair Knight Merz dated February 2013 	<ul style="list-style-type: none"> • Sections 10 – 16 • Construction environmental management Sub-plans
C2/C3	<p>(i) the additional requirements of this approval</p> <p>Incorporated documentation required by Condition C3:</p> <ul style="list-style-type: none"> • <i>C3(a) Flora and Fauna Management Plan</i> • <i>C3(b) Ground Cover Management Plan</i> • <i>C3(c) Landscape Plan</i> • <i>C3(d) Construction Noise Management Plan</i> • <i>C3(e) Traffic Management Plan</i> • <i>C3(f) Aboriginal Heritage Management Plan</i> 	<ul style="list-style-type: none"> • Section 9 Implementation • Attachment Sub-plan A • Attachment Sub-plan B • Attachment Sub-plan C • Attachment Sub-plan D • Attachment Sub-plan E • Attachment Sub-plan F
C2	<p>(j) a complaints handling procedure during construction identified in conditions C12 and C14</p>	<ul style="list-style-type: none"> • Section 21
C2	<p>(k) register of construction work hazards and the anticipated level of risk associated with each</p>	<ul style="list-style-type: none"> • Section 9.1 Risk Assessment of Construction Activities • Appendix D Register of Construction Hazards & Environmental Risks
C2	<p>(l) measures to monitor and manage soil and water impacts in consultation with NOW including: control measures for works close to or involving waterway crossings (including rehabilitation measures following disturbance and monitoring measures and completion criteria to determine rehabilitation success), identification of construction activities that are likely to pose a risk of groundwater interference, and procedures for managing groundwater impacts should they occur</p>	<ul style="list-style-type: none"> • Section 10 Soil and Water Management • Section 11 Rehabilitation and Revegetation Management

Condition	Condition description	CEMP section
C2	(m) measures to monitor and manage flood impacts in consultation with NOW	Section 9.2.2 Flood Risk
C2	(n) measures to monitor and manage dust emissions including dust generated by traffic on unsealed public roads and unsealed internal access tracks	<ul style="list-style-type: none"> Section 13 Dust and air quality
	(o) emergency management measures including measures to control bushfires	<ul style="list-style-type: none"> Section 8.5 Emergency Contacts and Response Section 10 Soil and Water Management Plan Section 9.2.1 Bushfire management
	(p) information on water sources	Section 6.5: Construction Water Supply

5.3 Approval and Licensing Requirements

The Broken Hill Solar PV Power Station has been approved in accordance with Section 75J of the *Environmental Planning and Assessment Act 1979*. No further approvals are required to be obtained by First Solar for the construction of the Broken Hill Solar PV Power Station.

The following licences and permits have been identified:

- The consent of RMS is required for the upgrade of the intersection of the site access road with the Barrier Highway before works commence
- Essential Water has agreed to supply raw water for the construction phase from an existing water mains near the Barrier Highway
- Broken Hill City Council as provided approval and conditions for the installation of a temporary water supply pipeline from the existing water mains.

Any other licenses, permits or approvals not identified within the First Solar CEMP, and deemed to be required through legislative changes, will be progressively obtained by the First Solar Environmental Manager during the course of the construction of the power station. The specific conditions of any additional approvals will be incorporated into this CEMP and issue specific Sub-plans as required.

6 Construction Activities

6.1 Program

As outlined in the SKM (2012) Environmental Assessment, the development program for the project is as follows:

- Construction – mid 2014 to late 2015
- Commissioning – 2015
- Operation – 2016 to 2045
- Decommissioning – 2045 onwards.

It is expected that the overall construction period will be approximately 17 – 18 months with the operation period of up to 30 years.

6.2 Construction Sequence

The construction sequence for the Broken Hill Solar PV Power Station will be divided into four phases. These phases are:

1. Site preparation, civil works, construction of site perimeter security fence, construction amenities and the construction of site access roads / tracks
2. Installation of posts, tilts, tables, panels and electrical cabling
3. Electrical commissioning, testing and grid connection
4. Demobilisation of construction related infrastructure.

At the conclusion of the construction of the power station, any temporary buildings or site features not required for the operation will be demobilised from the site.

6.3 Construction Activities and Duration

Construction activities, subject to CEMP approval, and their estimated duration are outlined below in Table 2. Information regarding the construction schedule will be provided to AGL and project status updates made available on the AGL Broken Hill Project website.

Table 2: Construction Activities and Expected Duration

Construction Phase	Activity	Expected Duration
1. Mobilisation and Site Preparation	<ul style="list-style-type: none"> • Install temporary perimeter fencing around the site for the duration of construction. • Install construction water pond, and water supply pipeline. • Install sediment and erosion control measures. • Localised cut and fill across the solar array power station area, retaining of existing vegetation cover where possible, slashing of shrubs if required. • Remove vegetation cover from construction office, laydown and parking areas. • Locate temporary construction offices, laydown areas and vehicle/equipment maintenance areas. • Earthworks for construction of power station access road and construction parking areas. • Minor grading of areas for permanent site office and switchyard. • Install drainage channels (to replace existing gullies) to manage water flows across the site. 	2.5 months
2. Construction of solar power station infrastructure	<ul style="list-style-type: none"> • Install steel vertical support posts for array tables (piles driven to ~1.5 m depth). • Install tilt brackets and modular racking tables (beams and rails create framework to support panels). • Undertake trenching and wiring of underground cables (within 6 m corridor, ~60 cm wide and 110 cm deep). • Connect PV modules to the racking tables. • Install inverter and transformer skid. • Commence site rehabilitation and revegetation works in power station development area. 	12 months
3. Commissioning	<ul style="list-style-type: none"> • Commission and test solar plant - each array block would be commissioned as it is completed. 	2 months
4. Demobilisation	<ul style="list-style-type: none"> • Remove temporary construction facilities and rehabilitate temporary access tracks. • Complete works within the power station development area. 	1 month

The bulk of the construction activity will be undertaken during phase 2. This phase will incorporate the installation of the solar modules and the associated infrastructure. This stage is the most labour intensive of the construction process. The sequence for installing the modules is as follows:

- Installation of the support poles
- Mounting and fastening of the bracket on the support poles
- Installation of the table surface to the support bracket
- Connection of the PV modules to the table surface
- Trenching and connection of associated cabling.

These tasks will be undertaken independently and sequentially in teams of workers progressing throughout the site.

Noise Impact Statements are not required for this construction work (see **Error! Reference source not found.**).

The timing for the commissioning of the power station will be subject to the completion of the grid connection and transmission line. The grid connection and transmission line is being constructed by a separate contractor reporting to the project owner (AGL).

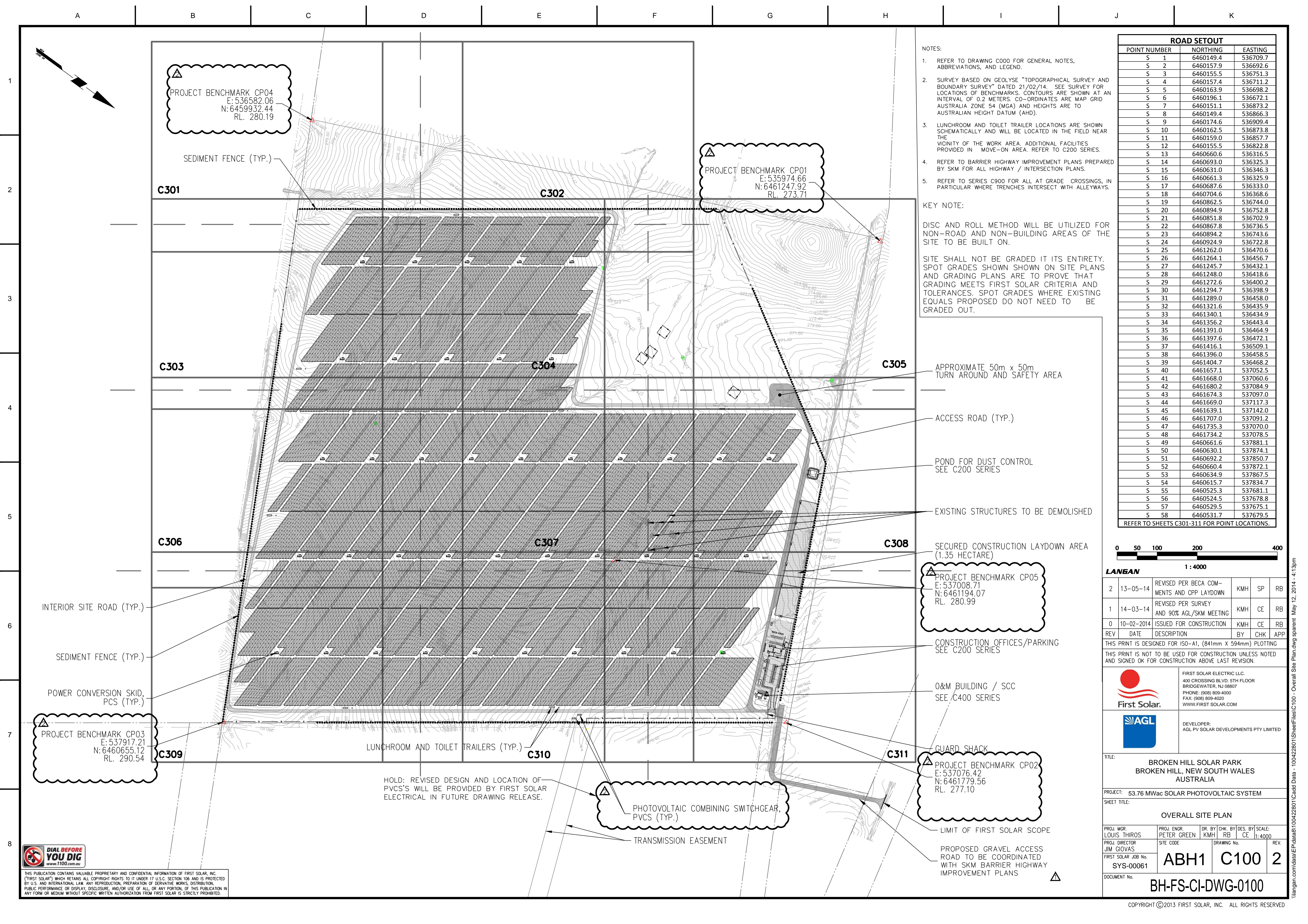
6.4 Construction Site Layout

This CEMP, including environmental management Sub-plans, are based on the overall site plan shown in Figure 1. This layout will be used to ensure consistency between the environmental management activities and the construction activities. All ancillary facilities shown on the plan (e.g. construction offices, parking and laydown areas) will be removed post construction.

Where amendments to the overall site plan are required, the Site Environmental Advisor will work with the Site Construction Manager to ensure that the changes to the layout are incorporated in the relevant CEMP Sub-plans.

Figure 1: Site Layout – ABH1 C100





- NOTES:
- REFER TO DRAWING C000 FOR GENERAL NOTES, ABBREVIATIONS, AND LEGEND.
 - SURVEY BASED ON GEOLYSE "TOPOGRAPHICAL SURVEY AND BOUNDARY SURVEY" DATED 21/02/14. SEE SURVEY FOR LOCATIONS OF BENCHMARKS. CONTOURS ARE SHOWN AT AN INTERVAL OF 0.2 METERS. CO-ORDINATES ARE MAP GRID AUSTRALIA ZONE 54 (MGA) AND HEIGHTS ARE TO AUSTRALIAN HEIGHT DATUM (AHD).
 - LUNCHROOM AND TOILET TRAILER LOCATIONS ARE SHOWN SCHEMATICALLY AND WILL BE LOCATED IN THE FIELD NEAR THE VICINITY OF THE WORK AREA. ADDITIONAL FACILITIES PROVIDED IN MOVE-ON AREA. REFER TO C200 SERIES.
 - REFER TO BARRIER HIGHWAY IMPROVEMENT PLANS PREPARED BY SKM FOR ALL HIGHWAY / INTERSECTION PLANS.
 - REFER TO SERIES C900 FOR ALL AT GRADE CROSSINGS, IN PARTICULAR WHERE TRENCHES INTERSECT WITH ALLEYWAYS.

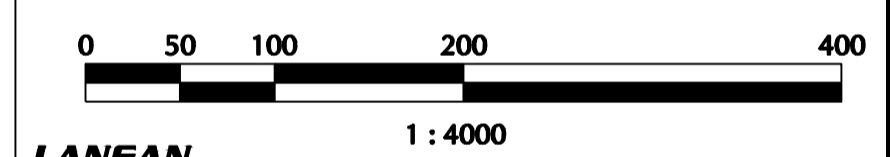
KEY NOTE:

DISC AND ROLL METHOD WILL BE UTILIZED FOR NON-ROAD AND NON-BUILDING AREAS OF THE SITE TO BE BUILT ON.

SITE SHALL NOT BE GRADED IT ITS ENTIRETY. SPOT GRADES SHOWN SHOWN ON SITE PLANS AND GRADING PLANS ARE TO PROVE THAT GRADING MEETS FIRST SOLAR CRITERIA AND TOLERANCES. SPOT GRADES WHERE EXISTING EQUALS PROPOSED DO NOT NEED TO BE GRADED OUT.

ROAD SETOUT		
POINT NUMBER	NORTHING	EASTING
S 1	6460149.4	536709.7
S 2	6460157.9	536692.6
S 3	6460155.5	536751.3
S 4	6460157.4	536711.2
S 5	6460163.9	536698.2
S 6	6460196.1	536672.1
S 7	6460151.1	536873.2
S 8	6460149.4	536866.3
S 9	6460174.6	536909.4
S 10	6460162.5	536873.8
S 11	6460159.0	536857.7
S 12	6460155.5	536822.8
S 13	6460660.6	536316.5
S 14	6460693.0	536325.3
S 15	6460631.0	536346.3
S 16	6460661.3	536325.9
S 17	6460687.6	536333.0
S 18	6460704.6	536368.6
S 19	6460862.5	536744.0
S 20	6460894.9	536752.8
S 21	6460851.8	536702.9
S 22	6460867.8	536736.5
S 23	6460894.2	536743.6
S 24	6460924.9	536722.8
S 25	6461262.0	536470.6
S 26	6461264.1	536456.7
S 27	6461245.7	536432.1
S 28	6461248.0	536418.6
S 29	6461272.6	536400.2
S 30	6461294.7	536398.9
S 31	6461289.0	536458.0
S 32	6461321.6	536435.9
S 33	6461340.1	536434.9
S 34	6461356.2	536443.4
S 35	6461391.0	536464.9
S 36	6461397.6	536472.1
S 37	6461416.1	536509.1
S 38	6461396.0	536458.5
S 39	6461404.7	536468.2
S 40	6461657.1	537052.5
S 41	6461668.0	537060.6
S 42	6461680.2	537084.9
S 43	6461674.3	537097.0
S 44	6461669.0	537117.3
S 45	6461639.1	537142.0
S 46	6461707.0	537091.2
S 47	6461735.3	537070.0
S 48	6461734.2	537078.5
S 49	6460661.6	537881.1
S 50	6460630.1	537874.1
S 51	6460692.2	537850.7
S 52	6460660.4	537872.1
S 53	6460634.9	537867.5
S 54	6460615.7	537834.7
S 55	6460525.3	537681.1
S 56	6460524.5	537678.8
S 57	6460529.5	537675.1
S 58	6460531.7	537679.5

REFER TO SHEETS C301-311 FOR POINT LOCATIONS.



REV	DATE	DESCRIPTION	BY	CHK	APP
2	13-05-14	REVISED PER BECA COMMENTS AND CPP LAYDOWN	KMH	SP	RB
1	14-03-14	REVISED PER SURVEY AND 90% AGL/SKM MEETING	KMH	CE	RB
0	10-02-2014	ISSUED FOR CONSTRUCTION	KMH	CE	RB

THIS PRINT IS DESIGNED FOR ISO-A1, (841mm X 594mm) PLOTTING
 THIS PRINT IS NOT TO BE USED FOR CONSTRUCTION UNLESS NOTED AND SIGNED OK FOR CONSTRUCTION ABOVE LAST REVISION.

First Solar.
 FIRST SOLAR ELECTRIC LLC.
 400 CROSSING BLVD, 5TH FLOOR
 BRIDGEWATER, NJ 08807
 PHONE: (908) 809-4000
 FAX: (908) 809-4020
 WWW.FIRSTSOLAR.COM

AGL
 DEVELOPER:
 AGL PV SOLAR DEVELOPMENTS PTY LIMITED

TITLE: **BROKEN HILL SOLAR PARK
 BROKEN HILL, NEW SOUTH WALES
 AUSTRALIA**

PROJECT: **53.76 MWac SOLAR PHOTOVOLTAIC SYSTEM**

OVERALL SITE PLAN					
PROJ. MGR.	PROJ. ENGR.	DR. BY	CHK. BY	DES. BY	SCALE:
LOUIS THIROIS	PETER GREEN	KMH	RB	CE	1:4000
PROJ. DIRECTOR	SITE CODE	DRAWING No.	REV.		
JIM GIOVAS					
FIRST SOLAR JOB No.	ABH1	C100	2		
SYS-00061					

DOCUMENT No. **BH-FS-CI-DWG-0100**

DIAL BEFORE YOU DIG
 www.1100.com.au

THIS PUBLICATION CONTAINS VALUABLE PROPRIETARY AND CONFIDENTIAL INFORMATION OF FIRST SOLAR, INC. ("FIRST SOLAR") WHICH RETAINS ALL COPYRIGHT RIGHTS TO IT UNDER 17 U.S.C. SECTION 106 AND IS PROTECTED BY U.S. AND INTERNATIONAL LAW. ANY REPRODUCTION, PREPARATION OF DERIVATIVE WORKS, DISTRIBUTION, PUBLIC PERFORMANCE OR DISPLAY, DISCLOSURE, AND/OR USE OF ALL OR ANY PORTION OF THIS PUBLICATION IN ANY FORM OR MEDIUM WITHOUT SPECIFIC WRITTEN AUTHORIZATION FROM FIRST SOLAR IS STRICTLY PROHIBITED.

I:\langan.com\data\EP\data\100422801\Cadd Data - 100422801\SheetFiles\C100 - Overall Site Plan.dwg sparent May 12, 2014 - 4:13pm

6.5 Construction Water Supply

6.5.1 Requirements and Description

The water requirement during the construction phase was estimated to be 150 kL/day. Water is required for dust suppression and bushfire response if necessary. Construction water may also be used for revegetation activities, such as reestablishment of ground cover and landscape planting.

Water will be supplied to the site during the construction phase by Essential Water, the responsible water supply authority in Broken Hill. Consultation with Essential Water has been undertaken to confirm water supply requirements for the construction and operational phases of the project.

The water will be supplied to the site by a temporary polyethylene pipeline cut in to an existing water main. The temporary water supply pipeline will connect from the mains water pipeline (near the Barrier Highway) to a standpipe located in the northern corner of the site.

This water will be piped to a construction water pond (located on the northern boundary) and used for dust suppression during construction, as well as other purposes. The temporary water pipeline route and location of construction water pond is shown in Figure 2 and Figure 3.

First Solar has consulted with Broken Hill City Council regarding the pipeline route and their requirements for activities within the Common. The pipeline sizing was based on water supply of 150 kL/day. The pipeline dimensions are:

- 2.7 km long
- 75 mm diameter.

The pipeline will be located on the surface except where it crosses a watercourse or road/track, in which case it will be placed under the bed of the watercourse/road/track, back filled and covered with geo-fabric and rock (100 mm).

The layout includes a water truck queuing area and two J Stand filling stations. The soil in the area was classed as intermediate infiltration but the pond will be lined to prevent subsurface water losses. The excavation of the pond will be managed in accordance with CEMP Sub-plan G Soil and Water Management.

The temporary pipeline will be removed and the construction water pond filled (following removal of liner) in at the completion of construction.

The advantages of delivery by pipeline and onsite storage include:

- Timely refilling of water carts for dust suppression
- Reduction of vehicle movements along the Barrier Highway and access road to the site
- Ongoing availability of water for construction, revegetation and landscaping purposes.

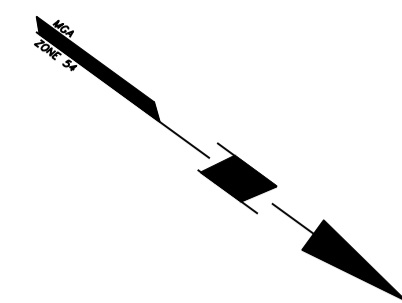


Figure 2: Layout Map showing the Proposed Pipeline Route, as supplied by AGL

Figure 3: Location of Construction Water Pond – ABH1 C800

A B C D E F G H I J K

1
2
3
4
5
6
7
8



SEDIMENT FENCE (TYP.)

CULVERT 15 (SEE SHEETS C359-C363 FOR ASSOCIATED TRENCH GRADING)

CULVERT 11J (SEE SHEETS C357-C358 FOR ASSOCIATED TRENCH GRADING)

CULVERT 11I (SEE SHEETS C51-C357 FOR ASSOCIATED TRENCH GRADING)

CULVERT E (SEE SHEETS C336-C343, C346-C350 FOR ASSOCIATED TRENCH GRADING)

CULVERT 7 (SEE SHEETS C333-C335 FOR ASSOCIATED TRENCH GRADING)

CULVERT 4 (SEE SHEETS C326-C332 FOR ASSOCIATED TRENCH GRADING)

DUST CONTROL POND (SEE SHEETS C200-C203 FOR DETAILS)

CULVERT 3 (SEE SHEETS C323-C325 FOR ASSOCIATED TRENCH GRADING)

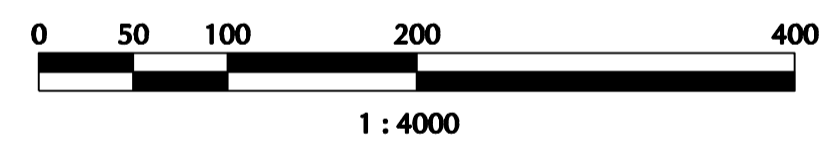
CULVERT 1 (SEE SHEETS C321-C322 FOR ASSOCIATED TRENCH GRADING)

CULVERT 11B (SEE SHEETS C344-C345 FOR ASSOCIATED TRENCH GRADING)

CONSTRUCTION ENTRANCE (SEE SHEET C811 FOR DETAILS)

SEDIMENT FENCE (TYP.)

- NOTES:
- REFER TO DRAWING CODE FOR GENERAL NOTES, ABBREVIATIONS, AND LEGEND.
 - SURVEY BASED ON GEOLYSE "TOPOGRAPHICAL SURVEY AND BOUNDARY SURVEY" DATED 23/09/13. CONTOURS ARE SHOWN AT AN INTERVAL OF 0.2 METRES. CO-ORDINATES ARE MAP GRID AUSTRALIA ZONE 54 (MGA) AND HEIGHTS ARE TO AUSTRALIAN HEIGHT DATUM (AHD).
 - A STABILISED SITE ACCESS WILL BE CONSTRUCTED AT THE SITE ENTRANCE. THE STABILISED SITE ACCESS WILL BE AT LEAST 15 METRES LONG AND 200MM THICK, CONSTRUCTED WITH MAXIMUM 75 MM AGGREGATE, AND UNDERLAIN BY NEEDLE-PUNCHED GEOTEXTILE. CONTRACTOR TO ENSURE ACCORDANCE WITH S06-14.
 - AN ENERGY DISSIPATER SHALL BE CONSTRUCTED AT THE OUTLET END OF EACH PROPOSED CULVERT IN ACCORDANCE WITH S05-8.
 - TOPSOIL FROM UTILITY TRENCHING WILL BE STOCKPILED NEAR THE TRENCH LOCATION, SEPARATE FROM SUB-SURFACE SOIL, AND BACKFILLED WITHIN 3 TO 5 WORKING DAYS. TOPSOIL SHALL BE REPLACED IN ACCORDANCE WITH S04-2.
 - SEE SHEET C902 FOR TRENCH SECTION DETAIL.
 - DISC AND ROLL METHODS WILL BE UTILIZED FOR NON-ROAD AND NON-BUILDING AREAS OF THE SITE TO BE BUILT ON.



LANGAN

REV	DATE	DESCRIPTION	BY	CHK	APP
0	10-02-2014	ISSUED FOR CONSTRUCTION	KMH	CE	RB

THIS PRINT IS DESIGNED FOR ISO-A1, (841mm X 594mm) PLOTTING
THIS PRINT IS NOT TO BE USED FOR CONSTRUCTION UNLESS NOTED AND SIGNED OK FOR CONSTRUCTION ABOVE LAST REVISION.

	FIRST SOLAR ELECTRIC LLC. 400 CROSSING BLVD, 5TH FLOOR BRIDGEWATER, NJ 08807 PHONE: (908) 809-4000 FAX: (908) 809-4020 WWW.FIRSTSOLAR.COM
	DEVELOPER: AGL PV SOLAR DEVELOPMENTS PTY LIMITED

TITLE: **BROKEN HILL SOLAR PARK
BROKEN HILL, NEW SOUTH WALES
AUSTRALIA**

PROJECT: **53.76 MWac SOLAR PHOTOVOLTAIC SYSTEM**

SHEET TITLE: **OVERALL SOIL AND WATER MANAGEMENT PLAN**

PROJ. MGR. GAVIN RANDALL	PROJ. ENGR. PETER GREEN	DR. BY KMH	CHK. BY RB	DES. BY CE	SCALE 1:4000
PROJ. DIRECTOR JIM GIOVAS	SITE CODE	DRAWING No.	REV.		
FIRST SOLAR JOB No. SYS-00061	ABH1	C800	0		

DOCUMENT No. **BH-FS-CI-DWG-0800**

INFORMATION SHOWN HEREON BASED ON A DRAFT SURVEY. CERTAIN SURVEY AND SITE LAYOUT INFORMATION IS PENDING OR SUBJECT TO CHANGE.



THIS PUBLICATION CONTAINS VALUABLE PROPRIETARY AND CONFIDENTIAL INFORMATION OF FIRST SOLAR, INC. ("FIRST SOLAR") WHICH RETAINS ALL COPYRIGHT RIGHTS TO IT UNDER 17 U.S.C. SECTION 106 AND IS PROTECTED BY U.S. AND INTERNATIONAL LAW. ANY REPRODUCTION, PREPARATION OF DERIVATIVE WORKS, DISTRIBUTION, PUBLIC PERFORMANCE OR DISPLAY, DISCLOSURE, AND/OR USE OF ALL OR ANY PORTION OF THIS PUBLICATION IN ANY FORM OR MEDIUM WITHOUT SPECIFIC WRITTEN AUTHORIZATION FROM FIRST SOLAR IS STRICTLY PROHIBITED.

\\langan.com\data\EP\data\BH1\00422801\Cadd Data - 100422801\SheetFiles\C800 - Overall SWMP.dwg kharding Feb 10, 2014 - 3:15pm

6.5.2 Consultation with Broken Hill City Council (BHCC)

Broken Hill City Council has provided approval for the water supply pipeline subject to general conditions for works undertaken within the Common. Essential Water will supply raw water for construction dewatering.

With regard to Council approval:

- AGL sought approval from Broken City Council (Council) to install the pipeline, which includes crossing the Willyama Common and watercourse crossing
- Council provided their requirements as they relate to Mineral Exploration within the Common. These were considered to be indicative of general requirements within the Common
- Council confirmed proposed measures for watercourse crossings and requirement for Contractors to check excavation areas for artefacts and notify if any finds.

BHCC confirmed the following approach to identification of artefacts was acceptable to meet their requirements for works on Willyama Common:

- The Contractor/s undertaking the pipeline works are to be inducted and briefed on the requirement to check for aboriginal artefacts and cease work if artefacts are found
- The Contractor/s is to notify BHCC if any artefacts are found.

The Contractor/s are to undertake training in the recognition of artefacts prior to commencement of excavation works for the water supply pipeline as well as the protocols described in Section 5.4.2 of the Aboriginal Heritage Management Plan (see CEMP Sub-plan F). This training is to be provided by individuals with good working knowledge of Aboriginal sites.

6.6 Utilities and Services

Utilities, services and other infrastructure potentially affected by construction (and operation) shall be identified prior to construction to determine requirements for access to, diversion, protection, and/or support. Consultation with the relevant owner and/or provider of services that are likely to be affected by the Project shall be undertaken to make suitable arrangements for access to, diversion, protection, and/or support of the affected infrastructure as required. The cost of any such arrangements shall be borne by the Proponent. The consultations will be with those utilities and services providers that have assets in the areas adjacent to the project site, and will include Dial-Before-You-Dig (1100).

7 Cumulative Impacts

7.1 Local Services

The Broken Hill Solar PV Power Station construction activities will not impact on existing services, including water, sewerage, communications or electricity. During the Construction Phase, the power station site will be self-sufficient. The strategy for the provision of services is summarised in Table 3.

Table 3: Provision of Services to the Project Site

Item	Source
Water	Potable water will be trucked to site to meet the needs of onsite personnel. Potable water will be held on tanks onsite and will not be connected to the local potable water supply.
Sewerage	Sewerage generated on the site will be captured in holding tanks onsite and removed from site by an appropriately licensed provider.
Communications	No impact on local communication services is expected during the Construction Phase.
Electricity	Onsite generators will be utilised to provide a power source during the Construction Phase.

7.2 Other Construction Projects

There is potential for cumulative impacts resulting from construction of the project, if it coincides with the construction of the Silverton Wind Farm project. The Silverton Wind Farm Project is located approximately 25 km north west of Broken Hill and would require equipment to be transported along local roads, thereby resulting in additional traffic. Because AGL will be constructing both the wind farm and solar power station, it will be possible for AGL to develop the Traffic Management Plans for each project and to manage potential cumulative traffic impacts. A Construction Traffic Management Plan for the Broken Hill Solar PV Power Station has been prepared (CEMP Sub-plan E) and will be updated, if required, to manage cumulative impacts associated with the wind farm project.

8.2 Construction Roles and Responsibilities

8.2.1 First Solar

CEMP Sub-plans were prepared to address specific issues. Each Sub-plan identifies the key roles for ensuring environmental compliance and describes the responsibilities of each role.

Environmental compliance is the responsibility of all site personnel, however the key persons responsible for environmental compliance during the construction of the Broken Hill Solar PV Power Station include:

- First Solar Site Project Manager
- First Solar Site Construction Manager
- First Solar Site Environmental Advisor
- Project Environmental Representative.

The primary responsibilities of each of the First Solar roles are described below. The role of the Project Environmental Representative is described in Section 8.2.2.

First Solar Site Project Manager

- CEMP Audits and provision of results to:
 - First Solar National HSE Manager
 - First Solar Site Project Manager
 - First Solar Site Construction Manager
 - First Solar Site Environmental Advisor
 - AGL's Project Manager
 - Environmental Representative.

First Solar Site Construction Manager

- Oversees supervisors and their construction personnel and advises the First Solar Project Manager and AGL Project Manager of all environmental incidents.
- Advising the Director-General of an environmental incident where an incident causes or threatens to cause material harm (in accordance with Condition C8).
- Notifying the EPA of an environmental incident.

First Solar Site Environmental Advisor

- Lead and facilitate environmental inductions and training (WEAC) for all site personnel.
- Work with the Site Construction Manager and Job Site Supervisor to identify activity specific environmental compliance training opportunities.
- Weekly site inspections.
- Implementation of all management procedures and sub-plans.
- Stop works in the event of an environmental emergency where a risk of material environmental harm is present.
- CEMP reviews, updates and training.
- Advising the First Solar Project Manager of the details of an environmental incident where an incident causes or threatens to cause material harm (in accordance with Condition C8).
- Advising relevant agencies of an environmental incident requiring notification under Condition B32 (in accordance with Sub-plan F Aboriginal Heritage Management Plan) and Condition B33 (in accordance with Historical Heritage Management, Section 12).

8.2.2 Project Environmental Representative

The responsibilities of the Environmental Representative are described in Condition C1 of the Project Approval. The approved Project Environmental Representative for the construction of the Broken Hill Solar PV Power Station is Michael Woolley of MCW Environmental.

The key aspects of the Environmental Representative role are summarised below:

- Suitably qualified and independent of the design and construction personnel
- Principal point of advice in relation to the environmental performance
- Monitor the implementation of the environmental management plans
- Advise the Proponent on matters specified in the Project Approval Conditions
- Ensure environmental auditing is undertaken as per the Proponent's Environmental Management System/s
- Authority to approve/reject minor amendments to the CEMP
- Authority and independence to require reasonable steps to be taken to avoid or minimise environmental impacts and direct cessation of activities if required
- Advise where resolution of points of conflict between the Proponent and the community is required.

8.3 Reporting

There are three types of reporting required during the construction of the Broken Hill Solar PV Power Station:

1. Reporting required in issue specific CEMP Sub-plans
2. Monthly compliance reporting
3. Incident based reporting.

Reporting is the responsibility of the Site Environmental Advisor/Site Construction Manager as specified in the CEMP Sub-plans. First Solar will provide monthly compliance monitoring reports to AGL and the Environmental Representative, throughout the duration of the construction phase. The monthly compliance report will be a concise factual report with the following headings:

1. Non-conformances and corrective actions:

- Weekly Site Inspections
- Environmental Monitoring
- Audits

2. Incidents and complaints

- Incidents and incident reports
- Complaints

3. Reporting against CEMP Targets

- Compliance with project approval conditions
- # Environmental incidents
- Compliance with environmental legal requirements
- Compliance with measurable measures outlined in the CEMP Sub-plans
- # Community complaints
- Compliance with complaint response, investigation and close-out timeframes
- Compliance with incident reporting, investigation and corrective action timeframes
- # Environmental non-conformances
- Compliance with timeframes for the investigation and implementation of corrective actions
- Compliance with timeframes for environmental audits and inspections
- Compliance with WEAC Training Commitments.

8.4 Environmental Training

All employees are required to undergo general Worker Environmental Awareness and Compliance Training (WEAC Training). This procedure is provided in Appendix C and associated forms in Appendix D (Environmental Management Schedules). The definition of employees includes all onsite personnel and visitors to the power station site.

WEAC Training will identify the environmental compliance requirements for all personnel and cover all relevant Conditions of Approval. Where applicable, training will also be provided that relates to the specific responsibilities of the employee (e.g. traffic management).

The site induction for all construction staff will include Aboriginal cultural heritage issues such as legislative protection of Aboriginal sites, application of protocols and the recognition of artefacts.

The WEAC Training will be delivered in the following ways:

1. The Broken Hill Solar PV Power Station site induction (all)
2. Targeted training sessions with relevant personnel (job specific)
3. Morning pre-starts or worker toolbox sessions.

8.5 Emergency Contacts and Response

First Solar will have a dedicated onsite Site Environmental Advisor present for the duration of the construction of the Broken Hill Solar PV Power Station. In the event that the Site Environmental Advisor is not available, an appropriate person from the First Solar HSE Team will be nominated to fill this role.

The Site Environmental Advisor will have authority to:

1. Stop or direct control works in the event of an environmental emergency
2. Direct clean-up activities in the event of an environmental emergency
3. Stop works where a risk of material environmental harm is present.

An environmental emergency is any event that causes or has the potential to cause material harm to the environment requiring notification to the Director-General in accordance with Condition C8 of the Project Approval.

Material harm to the environment is defined in Section 147 of the *Protection of the Environment Operations Act 1997*:

“(a) *harm to the environment is material if:*

- i) *it involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or*
- ii) *it results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000 (or such other amount as is prescribed by the regulations), and*

- (b) *loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment."*

Onsite emergencies will be managed in accordance with the First Solar HSE Emergency Response Plan. The Site Environmental Advisor will also be available on handheld UHF onsite during construction works. Contact information for the Site Environmental Advisor will be included within the WEAC Training Plan (Appendix C).

First Solar emergency contact details are:

- Name: Jeff McAuliffe
- Role: Project Manager
- Mobile phone: +61 427 254 489.

- Name: Turlough Guerin
- Role: Site Environmental Advisor
- Mobile phone: to be advised.

In the event of an environmental incident causing or threatening 'material harm' to the environment, the following authorities must be notified immediately (in this order):

- AGL Project Manager and the Environmental Representative (with an incident report submitted within 24 hours)
- The EPA (with an incident report to be submitted within 24 hours if the incident results in non-compliance with an environmental licence)
- Depending on the nature of the environmental incident the following are also to be contacted immediately:
 - Ministry of Health
 - WorkCover NSW
 - Local Council
 - Fire and Rescue NSW.

9 Implementation

9.1 Risk Assessment of Construction Activities

A risk assessment was undertaken in accordance with DIPNR (2004) *Guideline for the Preparation of Environmental Management Plans*. The function of the risk assessment is not to repeat or supersede the Project's Environmental Assessment or Conditions of Approval but to translate the environmental commitments and approval conditions into construction techniques.

This risk assessment provides the following:

- A list of the activities to be carried out
- Identification of environmental impacts associated with each activity
- Determination of which impacts are significant, i.e. low to high risk ratings
- Use of this information to design the environmental management activities, controls and monitoring to prevent or minimise those risks.

A register of construction work hazards, potential impacts, management measures and residual risk rating is provided in Appendix D Construction Hazards and Environmental Risk Register. The risk assessment matrix used in the SKM (2012) Environmental Assessment was adopted in this analysis for consistency.

The potential environmental issues to be managed throughout construction have been evaluated by the SKM (2012) Environmental Assessment, SKM (2013) Submissions and Preferred Project Report (SPPR) and Project Approval Conditions. The risk rating therefore considers the findings of these reports, including AGL's revised Statement of Commitments (SKM, 2013). The environmental issues to be addressed as required by the Project Approval conditions were listed in Section 5.2. This risk register shall be updated as required during construction if new work hazards are identified.

The risk assessment found that provided the control measures are implemented, it is expected there will be no residual high risks associated with the activities. The residual medium risks were:

- Impacts on flora and fauna (e.g. clearing and earthworks, vehicle movements)
- Cultural heritage (e.g. unexpected finds)
- Vehicle movements (e.g. vehicles transporting materials and employees)
- Soil and water management (e.g. clearing and earthworks)
- Dust emissions (e.g. clearing, earthworks, vehicle movements, trenching)
- Noise (and vibration) (e.g. pile driving, vehicle movements, earthworks activities)
- Releases of hazardous materials/dangerous goods (e.g. fuel on site)
- Waste management (e.g. during demolition phase).

9.2 Natural Hazard Management

9.2.1 Bushfire

The risk of bushfire was assessed in SKM (2012) Environmental Assessment. Relevant findings are summarised below:

- There has been no recorded bushfire or wildfire activity in the area since 2007
- The site is not considered to be a bushfire prone area because of the existing sparse and low lying vegetation cover
- Potential activities undertaken during the construction phase that may cause or increase the risk of fire include smoking, fuel driven equipment and motor vehicles, welding and soldering, mobile plant and gas torches
- The risk of the project causing a bushfire would be minor as the solar PV power station would not be a source of heat or ignition.

However, the Broken Hill climate generally presents a high bushfire risk and it is recommended these be further minimised through the implementation of appropriate management measures. First Solar/AGL has committed to consulting with NSW Rural Fire Services (RFS) and Broken Hill Council to verify the presence of any bushfire prone areas, and to maintaining an appropriate Asset Protection Zone around the solar power station (and transmission line).

The Project Approval Conditions include a requirement that all project components on site are designed, constructed and operated to minimise ignition risks, provide for asset protection consistent with NSW RFS design guidelines and provide emergency management including appropriate fire-fighting equipment and water supplies on site to respond to a bushfire. A specific bushfire management Sub-plan has been prepared as part of this CEMP.

Emergency management measures, including measures to control bushfires, have been developed by First Solar in consultation with the NSW Rural Fire Service (RFS). These measures were developed to meet the following objectives:

- Define appropriate measures and processes to minimise bushfire related risks during the construction of Broken Hill Solar PV Power Station
- Confirm the intent to continue to engage with the Rural Fire Service (RFS) in the implementation of this management plan as the construction schedule progresses
- Provide a monitoring, auditing and reporting framework to ensure the effectiveness of the bushfire controls implemented.

All construction personnel and contractors will be provided Worker Environmental Awareness and Compliance Training (WEAC) (Appendix C). Part of this program will include information on worker obligations in the event of a bushfire and the need to understand and comply with responsibilities for minimising the potential for creating a bushfire risk onsite.

Further detail on bushfire management is provided in Section 16. During the development of the bushfire management strategy, First Solar included all requirements / mitigations requested by the RFS and Broken Hill Fire Station.

9.2.2 Flood risk

The project site is drained by a creek system comprising tributaries of Stirling Vale Creek. The Stirling Vale Creek catchment originates immediately west of Broken Hill (SKM, 2012). The main drainage lines on the project site flow from the south and east to the north-west. The egress point is located approximately 400 metres east of the north western corner of the property boundary, where a farm dam lies within the drainage line. Overflow from the dam and any other surface flows eventually drain to the Stirling Vale Creek floodplain. Potential flooding sources for the project site include Stirling Vale Creek, Kellys Creek and associated tributaries (SKM, 2012).

Flood modeling and risk was assessed in SKM (2012) Environmental Assessment. The major findings of this assessment were summarized as follows:

- Flooding in Stirling Vale Creek does not result in elevated levels at the project site
- Culverts that direct flows under the Barrier Highway may be affected by flooding, resulting in flood flows over the road but surcharging water is not expected to be directed towards the site
- Flooding within the site would arise from three tributaries of Stirling Vale Creek, which are located within the solar PV plant site
- The estimated area that would experience flood depths between 0.25 and 0.5 m deep is ~1.8 % (3.1 ha) of the project site and 1.7 % (2.2 ha) of the solar plant area
- While the project site may be affected by flooding during a 100 year ARI event, flooding would be confined to the farm dam and the main drainage lines
- The project infrastructure is unlikely to have a significant impact on flood flows, flood behaviour or associated erosion potential because:
 - The project is not located on a major floodplain
 - Only a very small proportion of the project site would be affected by flooding during a 100 year ARI event
 - The project infrastructure is not located in the areas of the site that may be affected by flooding in the 100 year ARI event
 - The main project structures, including the solar panels, would not result in complete obstruction of surface sheet flows.

- In summary, the project is unlikely to be impacted by flooding

Based on the information provided in the Environmental Assessment, which concluded there was no potential for alteration of flows, there is no requirement for additional flood management (refer Soil and Water Management Plan Section 10).

9.3 Aboriginal Heritage

An Aboriginal heritage assessment was undertaken as part of the Broken Hill Solar Plant Environmental Assessment and reported in OzArk Environmental and Heritage Management (2013). The assessment recorded 14 Aboriginal sites, with eight located within the impact footprint of the power station, five located adjacent to the project site and one located adjacent to the transmission line easement.

The sites identified were either isolated stone artefacts or low density artefact scatters located in bare alluvial fan washout areas. These areas are associated with the narrowly incised ephemeral drainage channels trending southeast to northwest across the project site.

As a result of these finds, it was conditioned that Aboriginal community consultation be undertaken for an appropriate strategy to manage these objects. The outcomes of the community consultation included understanding of the cultural significance of the objects and development of management measures for impacted and avoided sites. The incorporation of the Aboriginal heritage assessment in this CEMP is described in Section 9.5.

Since the heritage assessment, the Aboriginal artefacts were relocated as reported in OzArk Environmental and Heritage Pty Ltd (2013) *Documentation of actions in relation to the Aboriginal Cultural Heritage Management Plan for AGL, Energy Limited, Broken Hill Solar Plant*. This documentation of actions report has not been included in this CEMP to protect the locations of the artefacts but all sites salvaged have had Aboriginal Site Impact Recording Forms (ASIRFs) produced and lodged with OEH.

9.4 Environmental Management Activities and Controls

This section summarises the environmental management activities to be implemented during the construction phase to prevent or minimise environmental impacts. The specific details for each potential environmental issue (e.g. flora and fauna, ground cover and landscape) are provided in Sub-plans, which are appended to this CEMP. The mitigation and control measures align with the risk ratings determined in Section 9.1.

The Sub-plans assign responsibility for control measures to specific personnel, provide timeframes for their implementation and describe monitoring measures and performance criteria. The management activities, responsibilities and timeframes are summarised in Table 4 below.

Table 4: Environmental Management Activities –Broken Hill Solar PV Power Station

Environmental Management Activity	Person Responsible	Timeframe/duration	CEMP Reference
Development and Implementation of CEMP			
Preparation of a <i>Construction Environmental Management Plan</i> (CEMP) in accordance with the Project Approval Conditions C2, C3 and A2.	First Solar Project Manager	Prior to construction.	(Condition C2)
Preparation of the CEMP Staging Document.	AGL Project Manager	Prior to construction.	(Condition A6)
Written approval for CEMP from Director-General.	AGL Project Manager	Prior to commencing any construction work.	(Condition C2)
Preparation of the Worker Environmental Awareness and Compliance (WEAC) Training Plan and include in the CEMP.	First Solar Project Manager	Prior to construction. Training within one week of commencement	Appendix C
Mobilisation, site preparation and construction of ancillary facility			
Salvage of Aboriginal artefacts: <ul style="list-style-type: none"> Aboriginal community consultation Salvage via surface collection and relocation Sites adjacent to the project footprint will be protected by high visibility temporary fencing during construction phase Aboriginal Site Impact Recording Forms (ASIRF) completed and lodged with OEH and AGL. 	AGL Project Manager Senior Archaeologist Representatives of the Registered Aboriginal Parties (RAP) (from the Broken Hill Aboriginal Land Council).	Completed by December 2013.	Aboriginal Heritage Management Plan (Sub-plan F) OzArk Environmental and Heritage Management (2013) <i>Documentation of actions in relation to the Aboriginal Cultural Heritage Management Plan for AGL Energy Limited (AGL), Broken Hill Solar Plant (December, 2013)</i>
Perimeter fencing.	First Solar Site Construction Manager	2.5 months	Flora and Fauna Management Plan (Sub-plan A).
Ecological pre-clearance surveys and exclusions e.g. buffer requirement Raptor Management Plan	First Solar Site Environmental Advisor		Flora and Fauna Management Plan (Sub-plan A).

Environmental Management Activity	Person Responsible	Timeframe/duration	CEMP Reference
			ngh environmental (2013a) <i>Broken Hill Solar Plant, Raptor Management Plan</i> .
Ground cover establishment and weed management.	First Solar Site Environmental Advisor		Ground Cover Management Plan (Sub-plan B).
Landscape planting.	First Solar Site Environmental Advisor		Landscape management plan (Sub-plan C).
Community consultation and signage – construction noise and traffic. Traffic signage on access roads.	First Solar Project Manager First Solar Site Construction Manager		Construction Noise Management Plan (Sub-plan D). Construction Traffic Management Plan (Sub-plan E). Community Consultation (Section 17.3.2).
Signage and exclusions of any aboriginal or historical heritage areas Protection and notification of unexpected finds of aboriginal or heritage artefacts.	First Solar Site Environmental Advisor		Aboriginal Heritage Management Plan (Sub-plan F). Historical Management (Section 12.3).
Erosion and sediment control measures.	First Solar Site Environmental Advisor		Soil and Water Management (Section 10).
Water supply pipeline and construction water pond.	First Solar Site Construction Manager		Dust and Air Quality Management (Section 13).
Bunded chemical storage areas.	First Solar Site Construction Manager		Dangerous Goods and Spill Response (Section 14.4).
Waste management system – e.g. waste materials, vegetation.	First Solar Site Environmental Advisor		Waste Management (Section 15.4)
Fire break around the site perimeter.	First Solar Site Construction Manager		Bushfire Management (Section 16.5)

Environmental Management Activity	Person Responsible	Timeframe/duration	CEMP Reference
Construction of Solar PV Power Station			
Ecological pre-clearance surveys – including surveys of open trenches.	First Solar Site Environmental Advisor	12 months	Flora and Fauna Management Plan (Sub-plan A). ngh environmental (2013a) <i>Broken Hill Solar Plant, Raptor Management Plan</i> .
Traffic management – transport of materials and personnel to site.	First Solar Site Construction Manager		Construction Traffic Management Plan (Sub-plan E). Construction Noise Management Plan (CEMP Sub-plan D).
Community consultation and signage – construction noise and vibration.	First Solar Project Manager		Construction Noise Management Plan (Sub-plan D). Community Consultation Management Plan (Section 17). AGL Energy Limited (2013) <i>AGL Community Consultation Plan Broken Hill and Nyngan Solar Plants</i> .
Protection and notification of unexpected finds of aboriginal or heritage artefacts	First Solar Site Environmental Advisor		Aboriginal Heritage Management Plan (Sub-plan F). Historical Management (Section 12.3).
Soil and water management, including erosion and sediment control, stormwater and drainage	First Solar Environmental Advisor		Soil and Water Management (Section 10).
Dust control.	First Solar Site Environmental Advisor		Dust and Air Quality Management Plan (Section 13.3).

Environmental Management Activity	Person Responsible	Timeframe/duration	CEMP Reference
Bunded chemical storage areas – fuel storage, maintenance workshop.	First Solar Site Construction Manager		Dangerous Goods and Spill Response Plan (Section 14.4).
Rehabilitation works within the developed blocks.	First Solar Site Environmental Advisor		Ground Cover Management Plan (Sub-plan B). Rehabilitation and Revegetation Management Plan (CEMP Sub-plan H).
Commissioning			
No specific management actions.		2 months	
Demobilisation			
Traffic management – transport of materials and personnel to site.	First Solar Site Construction Manager	1 month	Construction Traffic Management Plan (Sub-plan E). Construction Noise Management Plan (Sub-plan D).
Community consultation and signage – construction noise and vibration.	First Solar Project Manager		Construction Noise Management Plan (Sub-plan D). Community Consultation Management Plan (Section 17).
Dust control.	First Solar Site Environmental Advisor		Dust and Air Quality Management (Section 13).
Soil and water management, including erosion and sediment control, stormwater and drainage	First Solar Environmental Advisor		Soil and Water Management (Section 10).
Waste management system – including inert solid wastes, fuels and oils, other hazardous substances or	First Solar Site Environmental Advisor		Waste Management Plan (Section 15.4).

Environmental Management Activity	Person Responsible	Timeframe/duration	CEMP Reference
dangerous goods.			
Rehabilitation works and landscaping.	First Solar Site Environmental Advisor		Ground Cover Management Plan (Sub-plan B). Landscape management plan (Sub-plan C). Rehabilitation and Revegetation Management Plan (Section 11.4).

9.5 Condition C3 CEMP Sub-plans

The CEMP Sub-plans provided in this document cover all of the environmental issues to be addressed by First Solar during the construction of the Broken Hill Solar PV Power Station. The key CEMP Sub-plans are those required by Project Approval Condition C3 (a-f), which lists specific plans that must be prepared (see Table 5). These six key Sub-plans are provided as attachments to this CEMP.

Table 5: Condition C3 Sub-plans, Approval Conditions and References

Sub-plan	Relevant Approval Condition	Sub-plan Reference No.	Attachment Reference
Project Approval Sub-plans – Condition C3 (a-f)			
Flora and Fauna Management Plan	Condition C3(a)	A	Sub-plan A
Ground Cover Management Plan	Condition C3(b)	B	Sub-plan B
Landscape Plan	Condition C3(c)	C	Attachment Sub-plan C
Construction Noise Management Plan	Condition C3(d)	D	Attachment Sub-plan D
Construction Traffic Management Plan	Condition C3(e)	E	Attachment Sub-plan E
Aboriginal Heritage Management Plan	Condition C3(f)	F	Attachment Sub-plan F

9.6 General Condition CEMP Sub-plans

In addition to Condition C3 construction plan requirements, an additional eight sub-plans were prepared to address general project approval conditions. These sub-plans are listed in Table 6 and provided in the following sections.

Table 6: General Condition Sub-plans, Approval Conditions and References

Sub-plan	Relevant Approval Condition	Attachment Reference
Soil and water management	Condition B9	Section 10
Rehabilitation and revegetation management	Condition B23	Section 11
Historical heritage management	Condition B33	Section 12
Dust and air quality management	Condition B6 Condition C2(n)	Section 13
Dangerous goods and spill response	Conditions B5	Section 14
Waste management	Conditions B11, B12 and B13	Section 15
Bushfire management	Condition B3 and B4	Section 16
Community Consultation Plan	Condition C12	Section 17

10 Soil and Water Management

10.1 Purpose

This *Soil and Water Management Plan (SWMP) – Broken Hill PV Power Station* has been prepared to meet the requirements of the Broken Hill Solar PV Power Station Project Approval (MP10-0202) and the Broken Hill solar Plan Submissions and Preferred Project Report (SKM, February 2013).

The aims of the SWMP are to:

- Mitigate potential soil erosion and resulting water quality impacts on ephemeral watercourses and drainage lines within the project site
- Mitigate potential water quality impacts on land and water resources beyond the project site
- Manage onsite stormwater to protect the site from erosion derived from storm water transit across the surface of the disturbed areas.

This plan addresses Project Approval Conditions B9 and C2(l).

The plan addresses commitments WM1, WM2, WM3, WM4, WM5 and WM6.

The requirements for soil management relating to dust generation are described in Section 13.

10.2 Background

10.2.1 Geology and Soils

The Environmental Assessment (EA) prepared by SKM (October 2012) noted that the soil erosion risks associated with the project are considered to be low given that the project does not involve deep excavations or large scale earthworks and that the topography of the site is relatively flat.

An assessment of soil erosion hazard was not undertaken for this CEMP due to the flat nature of the site, which was reported to be an average slope 1.0% (SKM, 2012). According to Landcom (2004), land slopes less than 4% present low potential erosion hazard.

10.2.2 Hydrology Assessment

Key observations from the hydrology report undertaken by SKM (2012) include:

- The site slopes from southeast to northwest
- The site drops from approximately 285 metre AHD to 270 metre AHD over 1.4 km
- The average slope is 1%
- The majority of the site drains to the northern boundary

- The site has a small local catchment draining to the north-west of the site towards Stirling Vale Creek, approximately 700 metres from site boundary
- A very small proportion of the project site may be affected by flooding during a 100 year ARI event, which would be confined to the farm dam and main drainage lines. Therefore, the project is unlikely to be impacted by flooding
- Drainage within the site is shallow, overland sheet flow that combines and results in small incised channels, with the predominant area draining to the farm dam (located on the north west boundary)
- The drainage from the southern part of the site (or upper internal catchment of the site), is typically sheet flow into shallow gullies that are generally 0.3 to 0.5 metres deep and 1 to 2 metres wide.
- The gullies increase in size towards the dam where flow is expected to increase and erosion caused by increased flow is evident
- Main project structures, including the solar panels and transmission line poles, will not result in complete obstruction of surface sheet flows.

10.3 Construction Staging

10.3.1 Overview

The construction sequence for the Broken Hill Solar PV Power Station will be divided into four phases. These phases are:

1. Site preparation, civil works, construction of site perimeter security fence, construction amenities and site access roads / tracks
2. Installation of posts, tilts, tables, panels and electrical cabling
3. Electrical commissioning, testing and grid connection
4. Demobilisation of construction related infrastructure.

At the conclusion of the construction of the power station, any temporary buildings or site features not required for the operation will be demobilised from the site. Further detail on construction activities is provided in Section 6.3 of the CEMP document.

10.3.2 Site Preparation

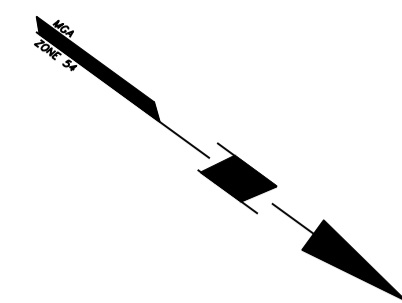
Of relevance to this plan is further information on the site preparation works. The approach will be to retain as much ground cover vegetation as possible. The preference is to slash shrubs to reduce height during construction (rather than clearing) and maintain soil structure. However, if clearing is required, then it will be removed by a scraper to blade off the top of the plant, above the soil level. Vegetation will be removed from the cut and fill areas shown in **Figure 5**.

Figure 5: Cut/Fill Model – ABH1 FG15

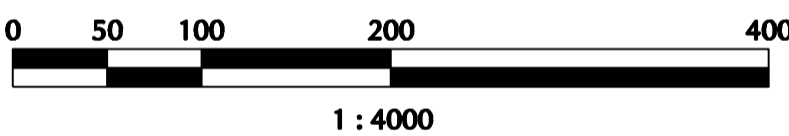
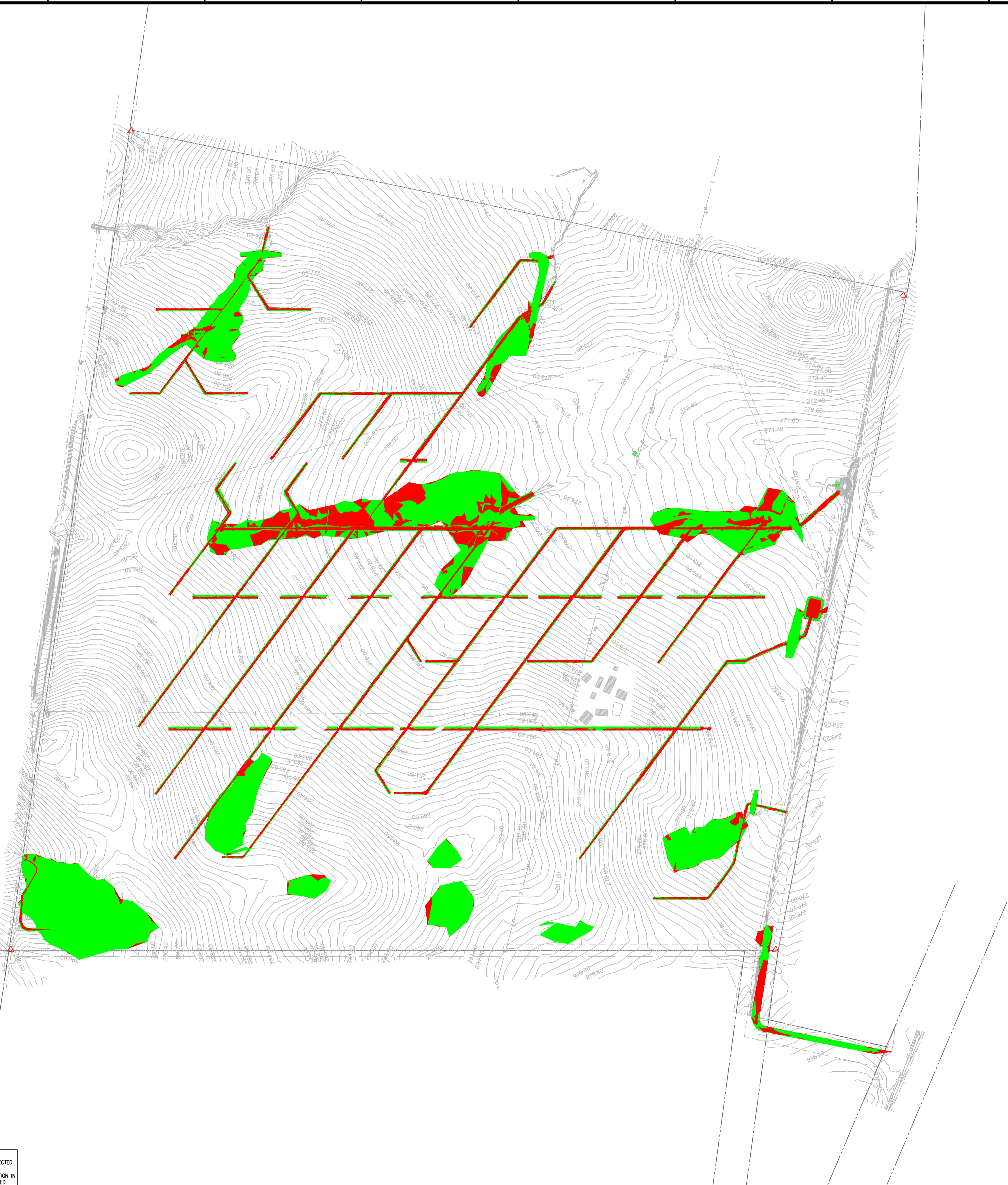


A B C D E F G H I J K

1
2
3
4
5
6
7
8



CUT/FILL LEGEND		
	VOLUME(Cu.M)	COLOR
CUT	19,430	■
FILL	22,220	■



LANGAN

REV	DATE	DESCRIPTION	BY	CHK	APP
0	10-02-2014	ISSUED FOR CONSTRUCTION	KMH	CE	RB

THIS PRINT IS DESIGNED FOR ISO-A1, (841mm X 594mm) PLOTTING
 THIS PRINT IS NOT TO BE USED FOR CONSTRUCTION UNLESS NOTED AND SIGNED OK FOR CONSTRUCTION ABOVE LAST REVISION.

	FIRST SOLAR ELECTRIC LLC. 400 CROSSING BLVD. 5TH FLOOR BRIDGEWATER, NJ 08807 PHONE: (908) 809-4000 FAX: (908) 809-4020 WWW.FIRSTSOLAR.COM
	DEVELOPER: AGL PV SOLAR DEVELOPMENTS PTY LIMITED

	DEVELOPER: AGL PV SOLAR DEVELOPMENTS PTY LIMITED
--	---

TITLE: **BROKEN HILL SOLAR PARK
 BROKEN HILL, NEW SOUTH WALES
 AUSTRALIA**

PROJECT: **53.76 MWac SOLAR PHOTOVOLTAIC SYSTEM**

SHEET TITLE: **CUT/FILL MODEL**

PROJ. MGR. LOUIS THIROIS	PROJ. ENGR. PETER GREEN	DR. BY KMH	CHK. BY RB	DES. BY CE	SCALE: 1:4000
PROJ. DIRECTOR JIM GIOVAS	SITE CODE	DRAWING No.	REV.		
FIRST SOLAR JOB No. SYS-00061	ABH1	FG15	-		

DOCUMENT No. **BH-FS-CI-DWG-FG15**

DIAL BEFORE YOU DIG
 www.1100.com.au

THIS PUBLICATION CONTAINS VALUABLE PROPRIETARY AND CONFIDENTIAL INFORMATION OF FIRST SOLAR, INC. ("FIRST SOLAR") WHICH RETAINS ALL COPYRIGHT RIGHTS TO IT UNDER 17 U.S.C. SECTION 106 AND IS PROTECTED BY U.S. AND INTERNATIONAL LAW. ANY REPRODUCTION, PREPARATION OF DERIVATIVE WORKS, DISTRIBUTION, PUBLIC PERFORMANCE OR DISPLAY, DISCLOSURE, AND/OR USE OF ALL OR ANY PORTION OF THIS PUBLICATION IN ANY FORM OR MEDIUM WITHOUT SPECIFIC WRITTEN AUTHORIZATION FROM FIRST SOLAR IS STRICTLY PROHIBITED.

\\langan.com\data\EP\data\100422801\Cadd Data - 100422801\SheetFiles\FG15 CUT FILL MODEL.dwg sparent May 28, 2014 - 5:50pm

10.4 Onsite SWMP Management

10.4.1 Principles

The principles that form the basis of the SWMP for the Broken Hill Solar PV Power Station are:

- Appropriate erosion and sediment control measures, consistent with the guidelines of the 'Blue Book' (Landcom, 2004), will be established before any cut/fill or ground disturbance begins and will be maintained in effective working order until the works have been completed and the affected ground surfaces stabilised
- Minimisation of disturbed areas: all work areas will be defined as far as practicable prior to construction commencing. Disturbance outside of defined areas will be kept to a minimum
- Minimisation of soil erosion potential during construction
- Diversion of clean water from undisturbed areas around or away from disturbed areas
- Control of water movement through the power station construction site (and throughout operation)
- Use of temporary erosion control measures as required for both the power station construction site and the access roads
- Direction of stormwater runoff from disturbed areas within the project site to sediment trapping devices. This will include the existing farm dam in the north west corner of the site, which will remain in place throughout the construction and operation period
- Maintenance of erosion and sediment control structures
- Site revegetation and rehabilitation
- Restriction of construction traffic to established roads and monitoring of soil on Barrier Highway (refer Sub-plan E *Construction Traffic Management Plan*). A systematic approach to monitoring and managing the road will be established at Broken Hill.

10.4.2 SWMP Awareness

The following information and guidelines shall be provided to employees and sub-contractors (via the Worker Environmental Awareness and Compliance (WEAC) Training program) engaged by First Solar as part of the construction of the Broken Hill PV Power Station:

1. The conceptual layout of the erosion and sediment control works required for the construction phase of the Broken Hill PV Power Station are as identified on Drawings ABH1-C000, ABH1-C800 and ABH1-C811 attached (Appendix E). The drawings and this report should be read in conjunction with relevant construction plans and documentation relating to the construction of the Broken Hill PV Power Station

2. Advice that the SWMP may require modification as construction progresses to comply with the documentation (or any subsequent iteration) specified in the Project Approval document MP10_0202
3. Instruction that all erosion and sediment control works are to be undertaken in accordance with this SWMP and constructed in a manner consistent with Managing Urban Stormwater – Soils and Construction Vol. 1 ‘Blue Book’(Landcom, 2004) as required by Condition B9 of the Project Approval document MP10_0202
4. Instruction on their responsibilities in reducing the potential for soil erosion and sediment pollution to downslope areas.

Onsite SWMP information will be communicated to onsite employees and contractors via the:

- Broken Hill Site Induction
- Daily pre-start meetings
- Toolbox meetings
- Onsite supervisors
- Site Environmental Advisor.

10.5 Land Disturbance

10.5.1 Extent of Disturbance

- The area of soil exposure/disturbance will be minimised in accordance with the work limitations described in Table 7.
- The limit of disturbance is defined in drawing ABH1–C800 and will be in accordance with the final site layout drawing. This includes the location of the ancillary facilities such as the site compound and laydown areas.
- Vehicle movements will be restricted to site access, perimeter and designated internal roads.

Table 7: Work Limitations

Land Use	Limitation	Comment
Construction Area	Wherever practicable, soil disturbance shall be restricted to an area no further than 5 metres from the edge of any essential construction activity (as shown on the power station and power station access track engineering drawings).	All site workers should <ul style="list-style-type: none"> recognise construction areas, which are identified with barrier mesh (upslope) and silt fencing (downslope), or similar materials appropriate to the specific onsite conditions.
Access Areas	Wherever practicable (i.e. where the flow of onsite traffic is not restricted), access tracks shall be limited to a width of 10 metres.	Access roads are shown on the power station and power station access track engineering plans. Access tracks will be identified using appropriate markers, e.g. barrier mesh, silt fencing, bunting or similar materials.
Remaining Land	Entry prohibited except for essential vehicles and personnel, e.g. vehicles and personnel associated with emergency response.	All site workers clearly recognise this land by marking boundary with barrier mesh or similar materials

10.5.2 Cut/fill

- Cut/fill will be kept to a minimum as far as practicable in order to retain as much of the existing natural ground cover as possible (where applicable, i.e. outside of areas of disturbance).
- The areas of disturbed soil will be kept to a minimum to reduce the potential for soil loss from site through wind erosion or via stormwater run-off and to reduce the potential for dust generation from exposed areas.
- Topsoil will be replaced as soon as possible to facilitate natural regeneration and minimise water and wind erosion.

10.5.3 Topsoil and Stockpile Management

- Topsoil disturbance will be minimised as far as practicable. Where disturbance to topsoil is unavoidable (e.g. in areas of cut/fill within the array areas and roadway / access track construction) topsoil will be lightly stripped / trimmed during site preparation and stockpiled in defined onsite stockpile areas.
- Topsoil shall be stripped and stockpiled before commencing any bulk earthworks around the site ancillary facilities (both temporary and permanent). Topsoil shall be stockpiled in



accordance with Drawing ABH1–C811, the guidelines outlined in Managing Urban Stormwater – Soils and Construction Vol. 1 (Landcom 2004) and industry best practice.

- Stockpile areas will be located in accordance with final site layout drawing. They shall be located 40 metres away from watercourses and outside of drainage lines, including constructed drainage channels.
- Separate stockpiles shall be used for topsoil and subsoil (if any). Stormwater diversion structures will be installed upslope of stockpiles as required. The diversion structures will be installed in accordance with the provisions of the Managing Urban Stormwater – Soil and Construction Vol. 1 (Landcom, 2004).
- Excess topsoil shall be retained and used in site rehabilitation (as far as practicable).
- Excess topsoil unable to be retained on site shall be disposed of at an appropriate fill storage site.
- Disturbed areas would be used preferentially for vehicle and machinery access, materials laydown, stockpiling of cleared vegetation and the deposition and retrieval of spoil where practicable.
- A water truck will be utilised routinely on site, wetting all access roads and exposed dusty surfaces as appropriate to the conditions of the site. Dust control techniques (see Section 13.4) will be utilised in the event that topsoil stockpiles exhibit significant dust lift off.

10.5.4 Stabilisation

- Temporary stabilisation works shall be undertaken on disturbed areas within power station site that are likely to remain unattended for more than 30 days during construction. Temporary stabilisation methods shall be as described in the Blue Book (Landcom 2004).
- Complete permanent rehabilitation works on disturbed areas as soon as practicably possible following conclusion of onsite construction works. Further detail on site rehabilitation and revegetation works is provided in Section 11.
- All disturbed surfaces will be stabilised and restored as soon as possible using appropriate stabilisation and re-vegetation measures. The plants used for site restoration will comprise native species endemic to the project site and suitable for the site conditions, taking into account soils, climate and shading.
- Before placing topsoil on areas being rehabilitated, the surface shall be cleared of any construction material, scarified or ripped (depth to be subject to the extent of subsoil compaction) along the contour to provide keying for topsoil.

- Topsoil and sub-soil shall be handled moist and reapplied to a depth consistent with the existing onsite soil profile as far as practicable.
- A stabilised site entrance access road shall be constructed at the location shown in Drawing ABH1-C800.
- The construction access road from the Barrier Highway will be gravel to minimise erosion.

10.5.5 Erosion Control and Stormwater Management

- Appropriate erosion and sediment control measures, consistent with the guidelines of the 'Blue Book' (Landcom, 2004), will be established before any clearing, excavation or ground disturbance begins and will be maintained in effective working order until the works have been completed and the affected ground surfaces stabilised.
- Clearly visible barrier fencing or appropriate demarcation markers shall be installed at the limit of disturbance (as shown on Drawings ABH1–C800) and on the final site layout drawing, and elsewhere within the Broken Hill PV Power Station at the discretion of the First Solar Construction Manager (in consultation with the First Solar Environmental Advisor), for traffic control and to restrict unnecessary site disturbance.
- Slope lengths on disturbed areas will be kept as short as necessary to minimise the risk of soil loss. The Broken Hill PV Power Station site presents a low potential erosion hazard (average slope <1%). However where appropriate, slope length will be regulated through the construction of temporary diversion berms across disturbed areas, through use of silt fence as required or through the employment of other appropriate erosion and sediment control device.
- Temporary diversion drains shall be completed as required at the end of each working day or when heavy rain is imminent. These will be designed to control onsite storm water runoff, including diverting clean runoff away from disturbed areas as far as practicable.

10.5.6 Sediment Control

- The site shall have a silt fence on the northern, eastern and southern boundaries as per Drawing ABH1-C800.
- Silt fences shall also be installed on the downslope of the site compound and laydown areas.
- Silt fences shall also be installed on the downslope of other disturbed areas, or at the discretion of the Construction Manager (in consultation with the Site Environmental Advisor).
- Silt fences shall be installed and constructed as per Drawing ABH1–C811.

- Vegetation downslope of silt fences and below discharge points of temporary diversion drains should remain undisturbed (as far as practicable) to act as filter strips.
- Sediment shall be removed from sediment control measures when it increases to a level that reduces the volume of the measure by 30%. Sediment removed shall be disposed in locations where further erosion and consequent sediment pollution of downstream lands and waterway will not occur and / or the sediment shall be placed in areas protected by soil erosion protection works.
- Erosion and sediment controls have been designed to ensure that water leaving the site will be in compliance with the ANZECC & ARMICANZ (2000) water quality criteria for total suspended solids.
- Temporary erosion and sediment control measures will be removed only after rehabilitation works have been completed on more than 90% of the contributing catchment or where site stabilisation has been achieved to a standard where the erosion is removed as far as practicable.

The NSW Office of Water has approved the proposed works outlined in Section 10.5.5 and 10.5.6 (above) (refer to correspondence between First Solar and NSW Office of Water in Appendix G - Agency Consultation).

10.6 Water

10.6.1 Construction Water

The source and supply of construction water is described in Section 6.5. The site will use water provided by Essential Water by cut in to an existing water main near the Barrier Highway.

The main use of water during construction shall be for dust suppression. The estimated water usage has been revised to 150 KL/day during peak construction. This volume will vary on daily basis dependent on climatic conditions and construction activities on site.

Records of water used in construction would be maintained on Form-G01 (see Appendix D – CEMP Environmental Management Schedules). No groundwater shall be used on site for construction purposes.

10.6.2 Flooding and Waterways

The risk of flood on the site is described in Section 9.2.2 of the CEMP. SKM 2012 reported that the project site may be affected by flooding during a 100 ARI event, but that flooding would be confined to the main drainage lines and the farm dam within the drainage system in the north west corner of the site. The proposed site drainage network is described in the following section.

In the event of a significant flood event First Solar will remove flood debris from around the security perimeter fence and from within the site where debris traverses between onsite infrastructure. The purpose of the debris removal will be to avoid alterations to flood paths occurring as a result of debris build up.

Fuel and chemical storage areas shall be located above the 20 year ARI and bunded in accordance with the procedures described in Section 14.3 of the CEMP.

In compliance with Project Approval Condition B9, works to be undertaken within 40 metres of watercourses are to be carried out in accordance with the *Guidelines for Controlled Activities on Waterfront Land* (NOW, July 2012).

In compliance with Project Approval Condition B10, any waterway crossings shall be designed and constructed in consultation with NOW and DPI (Fisheries) and consistent with DPI (Fisheries) guidelines *Policy and Guidelines for Fish Friendly Waterway Crossings (2004)* and *Fish Passage Requirements for Waterway Crossings (2004)*.

10.6.3 Proposed Site Drainage

The development of the solar power station site includes the construction of drainage channels across the site to manage overland flows as indicated by the existing incised (and eroded) shallow gullies across the site, which primarily discharge to the farm dam. For the developed case, one of the drainage channels will continue to discharge to the farm dam, which will also form a sediment basin.

The overall site plan and channel location plan is shown in Drawing ABH1-C320 (Appendix E). Most of the flow will be directed to the northern and western boundaries (there is one channel in the southeastern corner).

An example of the channel arrangement including road culvert and requirements for energy dissipation is provided in Drawing ABH1-C346 (Appendix E). The soil and water management details are shown in Drawing ABH1-C811.

The drainage channels will be lined with rock in entirety as per Landcom 2004 standards to cover the channel banks to reduce the erosive energy of flow. To provide additional bed stability and suitable energy dissipation measures, each channel will extend 16 m beyond the culvert to act as a scour apron. An example of the channel arrangement including road culvert and requirements for energy dissipation is provided below in Figure 6 (and also Drawing ABH1-C346 Appendix E). The soil and water management details are shown in Drawing ABH1-C811.

Any culverts crossing waterways will be designed in accordance with:

- DPI Policy and Guidelines for Fish Friendly Waterway Crossing
- Fairfull, S. and Witheridge, G. (2003) Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings. NSW DPI.

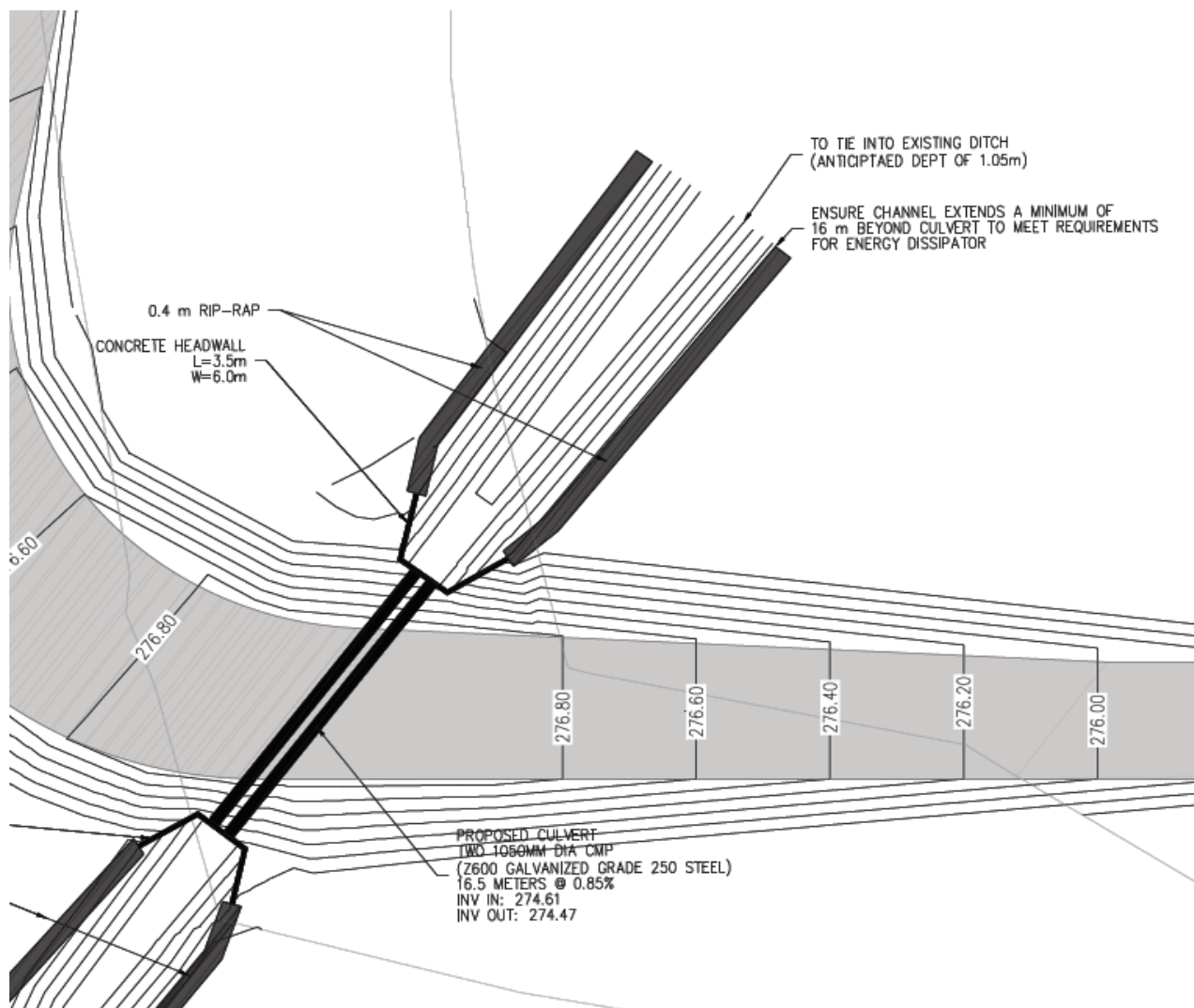


Figure 6: Typical downstream culvert detail

10.6.4 Groundwater Resources

The site is located within the Adelaide Fold Belt groundwater management unit. The standing water level of the nearest groundwater bore 4 km south-west of the site is 17.70m.

10.7 Site Inspection and Maintenance

The Site Environmental Advisor will undertake weekly inspections of the erosion and sediment control measures and devices and initiate repair or maintenance as required. The weekly inspection and maintenance program shall include:

- Checking that all drains are free of blockages and allow water flows as designed
- Removing spilt sand, soil or other material from within 2 metres of hazard areas i.e. areas with concentrated high velocity flow
- Inspect drainage channels and discharge from site following rain events

- Inspecting rehabilitated lands to make for any downslope sediment movement
- Inspect entry site for dirt/mud tracking off site
- Maintaining sediment traps in good working condition in accordance with design specifications
- Directing construction of additional erosion and sediment control measures if required.

10.8 Responsibilities

Project Manager

- Obtaining approval for access to construction water for the construction of the Broken Hill PV Power Station and access tracks prior to construction commencing.
- Advising the Construction Manager and Site Environmental Advisor of approved access source for construction water.

Construction Manager

- Implementation of this SWMP in coordination with the Site Environmental Advisor.
- Coordination of access to construction water.
- Maintaining records of water used for construction purposes and its source (Form G01).

Site Environmental Advisor

- Completion of weekly site inspections as described in Section 10.7 and documentation using Form-P01.
- Completion of inspection immediately following rainfall exceeding 15 mm in 24 hours on Form-P01.
- Implementation of this SWMP in coordination with the Construction Manager.
- Coordination and approval of any changes to the SWMP.

Construction Supervisors

- Implementation of the SWMP.
- Observing SWMP principles.
- Reporting SWMP issues to the Construction Manager.

Construction Crew, Contractors and Sub-contractors

- Observing SWMP principles.
- Reporting SWMP issues to the Construction Supervisors.

10.9 Records

- Records of weekly and rainfall events inspections are maintained on Form-P01.
- Records of water used in construction would be maintained on Form-GC01.

10.10 Soil and Water Management Drawings

The following soil and water management drawings are presented Appendix E.

- Drawing ABH1-C000
- Drawing ABH1-C800
- Drawing ABH1-C811
- Drawing ABH1-C320
- Drawing ABH1-C346

11 Rehabilitation and Revegetation Management

11.1 Objectives

The objectives of this revegetation and rehabilitation management plan are to:

- Implement revegetation and rehabilitation measures across the construction footprint (i.e. excluding areas required for on-going operation of the project)
- Implement revegetation measures progressively and within six months of the cessation of construction activities at each location
- Monitor and maintain the health of all revegetated areas until such time that the sustainability of the plantings have been verified by an independent expert.

The independent expert will be identified prior to commencement of construction and be provided with an opportunity to review this Sub-plan prior to commencement of works. The role and responsibilities of this expert will be discussed and agreed at this stage.

11.2 Approval Conditions, Commitments and Plan Interfaces

The Revegetation and Rehabilitation Program for the Broken Hill Solar PV Power Station has been prepared to meet the requirements of:

- The Broken Hill Solar PV Power Station Project Approval (MP10-0202)
 - Condition B23.
- Broken Hill Solar Plant Submissions and Preferred Project Report (SKM, February 2013)
 - Commitment FF7
 - Commitment FF8.

This sub-plan interfaces with:

- Sub-plan A – Flora and Fauna Management
- Sub-plan B – Ground Cover Management
- Soil and Water Management Plan
- Dust and Air Quality Management Plan.

It is noted that rehabilitation in climates such as at Broken Hill can be complex and require local knowledge and experience. Therefore First Solar enlisted the support of a Senior Botanist/Ecologist from Biosis Pty Ltd - Matthew Gibson.

Matthew has a broad knowledge and understanding of environmental issues and conservation management, as well as being familiar with the rangelands of western NSW. Matthew has excellent

plant identification skills across a wide range of environments, as well as undertaking monitoring, habitat hectare assessments, condition assessment, mapping, analysis of biodiversity data and targeted searching for rare and threatened species. He also has extensive experience as a Consultant in natural resource management projects involving stakeholder consultation and interactions between managing authorities.

11.3 Environmental Context

11.3.1 Revegetation

The requirement for revegetation (and restoration) will depend on the extent and nature of soil disturbance. The restoration requirements for small trenches will be different to that for drainage channels and areas beneath the solar arrays, for example. Where restoration is required, the objective will be to use a seed mix that will provide an initial protective canopy cover using short lived annual grasses followed by a grass species that is likely to provide good cover over the long term.

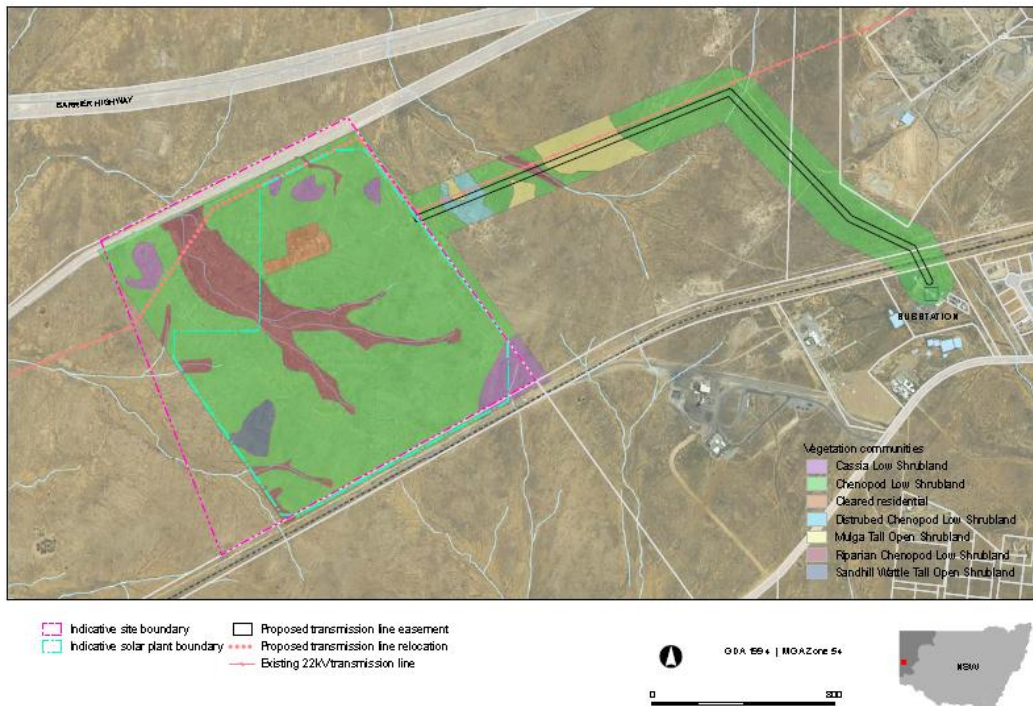
11.3.2 Rehabilitation

The objective of site rehabilitation will be to restore all disturbed areas caused by construction and maintenance activities to a stable environment that reflects the pre-construction landscape characteristics of the surrounding area.

To achieve the landscape characteristics it is preferable to seed with local native ground cover species or to allow natural regeneration and colonisation of disturbed areas. At the Broken Hill site, the project area supports remnant vegetation in a natural condition with some disturbance from selective vegetation clearing, track formation and minor weed invasion as a result of past land uses (SKM, 2012). The vegetation cover is dominated by chenopod shrublands with some small areas also supporting wattle species.

Figure 6 below illustrates the vegetation communities on of site prior to construction, which cover is dominated by chenopod shrublands with some small areas also supporting wattle species.

Figure 7: Vegetation communities at the Broken Hill site



11.4 Impact Footprint Revegetation

11.4.1 Construction Areas

All areas of the development footprint that are disturbed during construction of the Solar PV Power Station, but are not required for on-going operation of the site (such as temporary construction facility sites and sections of construction access roads) will be revegetated and rehabilitated. This plan excludes the following areas:

- Slashed/cleared power station areas (beneath the solar arrays and in accordance with the Cut/Fill model), which will be revegetated and stabilised as per Sub-plan B – Ground Cover Management Plan
- Boundary areas outside the power station boundary but within the project site boundary, along the northern and western boundaries, which will be planted in accordance with Sub-plan C – Landscape Plan.

This plan therefore, refers to revegetation and rehabilitation of land disturbed during construction but with no future use requirement as part of the power station.

As required by Commitments WM5 and AQ3, all other disturbed surfaces will be stabilised and restored as soon as possible using the measures outlined in this plan.

11.4.2 Revegetation and Rehabilitation Strategy

A similar strategy will be applied to restoration of temporary construction areas as for ground cover management, provided the approach used results in stabilisation of disturbed areas within six months of cessation of construction activities. Revegetation measures will be implemented progressively where possible and in all cases within six months of the cessation of construction activities at the relevant area.

The approach to restoration will be:

- Active restoration of construction laydown areas, site access tracks construction water pond:
 - Removal of construction materials such as gravel, liners
 - Grading or minor earthworks if required
 - Ripping of subsoil prior to cover with topsoil
 - Natural regeneration, sowing with a ground cover mix or planting as per landscaping plan
- Non-invasive or natural restoration of areas where the soil has not been compacted or overlain with gravel or other building materials. These areas may be cordoned off, watered and monitored for ground cover establishment
- Undertake revegetation activities progressively as temporary construction areas or facilities cease activity
- Use of residual native vegetation from site clearing in restoration or landscaping
- Project Ecologist/s will be engaged to supervise any active restoration works.

11.4.3 Active Restoration

Native species

In accordance with Commitments FF8, the site restoration will be undertaken during and after construction using locally endemic native species, including:

- Medium and small indigenous perennial shrubs
 - Bladder Saltbush – *Atriplex vesicaria*
 - Cottony Saltbush – *Chenopodium curvispicatum*
 - Silver Tails - *Ptilotus obovatus* var. *obovatus*
 - Black Bluebush – *Maireana pyramidata*
 - Pearl Bluebush – *Maireana sedifolia*
- Spreading or prostrate indigenous shrubs
 - Ruby Saltbush – *Enchylaena tomentosa*
 - Silky Bluebush – *Maireana villosa*
 - Broken Hill Pea – *Swainsona fissimontana*

- Corrugated Sida – *Sida corrugata*
- Climbing Twinleaf – *Zygophyllum eremaum*
- Perennial indigenous tussock grasses
 - Speargrass – *Austrostipa scabra*
 - Bottle Washers – *Enneapogon avenaceus*

Seeding rates

Native seeds may be purchased from Australian native plant seed suppliers. Seeds may require pre-treatment prior to sowing, such as stratification, hot water, smoking.

Seed application rates should indicatively be 750 to 1500 grams of seed per hectare, subject to the type of seeds used and specific site conditions.

A commercial contractor would be used for sowing for larger areas, in smaller areas hand operated seeders would be adequate and utilised where practicable to allow for timely resowing. Native seeds will be obtained from a certified weed free Australian native seed stockist.

11.5 Natural Regeneration

Natural regeneration should occur at the site provided topsoil is managed by re-spreading across the area and minimising erosion. In the case of revegetation of temporary construction areas, this would require that topsoil has been maintained since the initial clearing works and is free of any noxious weeds (refer Groundcover Management Plan).

This approach would allow time to monitor vegetative growth to determine whether active regeneration was required. However, if direct seeding was required in some areas, the land would need to be re-cultivated and seeded, which may disturb any natural regeneration that may have occurred.

11.6 Recommended Procedure

The final goal is to revegetate the former construction facility areas so that disturbed ground does not remain bare and is stabilised by vegetation cover within six months of cessation of work. The recommended procedure is to:

- Manage topsoil as per the Ground Cover Management Plan and the Soil and Water Management Plan
- Monitor the natural revegetation (composition and cover) approximately four – six months following restoration of the topsoil
- Identify areas with inadequate natural regeneration, or areas being colonised by weeds
- Control any weeds within these areas
- Apply direct seeding techniques within these areas, using the species listed in Section 11.4.3, at a rate of 750 to 1500 grams per hectare

- Continue to monitor natural regeneration areas and direct seeded areas, control weeds and re-seed as required.

As any groundcover plantings are undertaken, the date of sowing, application rates and a record of the seed mix applied will be recorded on Form-GC01. A photographic log will also be recorded (refer Form-GC02 attached) at this time to allow for comparative monitoring. The locations of all rehabilitated areas will also be recorded on a site plan.

Where practicable (in accordance with Commitment W2), excavated spoil will be re-used on the site for fill or landscaping.

11.7 Areas of Outside of the Impact Footprint

In accordance with Commitment FF7, degraded portions of the site outside of the impact footprint will be restored. The restoration of these areas will be undertaken to the extent required to:

- Reduce the potential for wind erosion
- Improve opportunities for fauna habitation and movement across the landscape
- Reduce the risk of weed invasion.

The procedure for restoration of these areas will be to:

- Cordon off the impacted area
- Install water diversion bunds and sediment controls if necessary
- Scarify the topsoil if required to allow natural regeneration and spread any available topsoil across the site
- Control any weeds
- Allow the area to regenerate.
- Monitor the area.

11.8 Monitoring

The restoration areas will be maintained and monitored until such time that the plantings have been verified by an independent expert as well established, in good health and self-sustaining.

The following monitoring procedure will apply:

- Photograph restoration sites at monthly intervals
- Estimate % groundcover at monthly intervals - % beneficial, % weeds
- Record volume of noxious weed removed from each area, and disposal method.

The performance targets will be based on the existing ground cover on the site. This % coverage is estimated to be 40-50% (based on a site visit by First Solar) but will be confirmed during pre-clearance surveys.

Where revegetation and rehabilitation of disturbed areas (within the construction footprint and as a result of construction activities) does not appear to be successful (i.e. poor establishment/germination rates, poor plant condition and weed infestations), First Solar will engage a Project Ecologist to advise on corrective actions (which is consistent with the Ground Cover Management Plan).

11.9 Responsibilities

Project Manager

- Revegetation and rehabilitation of the nominated areas is undertaken progressively and within six months of cessation of works.

Construction Manager

- Undertaking removal of materials such as gravel prior restoration of land used for temporary construction facilities.
- Undertaking any earthworks required prior to restoration.
- Undertaking scarification of land prior to restoration, implementing diversion bunds or sediment and erosion controls.
- Relocating topsoil if required for re-spreading across restoration areas.

Site Environmental Advisor

- Coordinating rehabilitation activities.
- Specification and procurement of any native seed mixes required.
- Weekly inspection of rehabilitation areas.
- Completion of rehabilitation management records.
- Engagement of Project Ecologist if required.

11.10 Records

- Records of rehabilitation management activities are maintained on Form-GC02.
- Records of monitoring photographs taken during rehabilitation and revegetation on Form-GC03.

12 Historical Heritage Management Plan

12.1 Objectives

The objectives to the historical heritage management plan are to protect any unexpected historic finds. This plan has been prepared to address:

- The Broken Hill Solar PV Power Station Project Approval (MP10-0202)
 - Condition B33
- Broken Hill Solar Plant Submissions and Preferred Project Report (SKM, February 2013)
 - Commitments H1 and H2.

12.2 EIS Context

- As outlined in Section 12.2.1 of the Broken Hill EIS, a desktop study of relevant historical heritage registers was undertaken during the development of the EIS to identify any historical heritage (non-aboriginal) items or places in proximity to the site. The desktop study had a particular focus on the proposed works site.
- The historical heritage searches undertaken by Sinclair Knight Merz identified that there were no known historic heritage items on or within one kilometre of the site. The desktop assessment findings were supported by a subsequent site inspection for Aboriginal and Historical Heritage.
- Within Section 12.2.1 of the EIS, Sinclair Knight Merz identifies the presence of archaeological “relics” (as defined by the *Heritage Act 1977*) within the project footprint is considered unlikely.
- Irrespective of the above findings, First solar has developed a procedure for dealing with the accidental discovery of unidentified heritage items. This procedure is outlined in Section 12.3.1. The First Solar procedure has been developed in accordance with Section 12.2.3 of the EIS.

12.3 Actions

12.3.1 Procedures for Dealing with Unidentified Objects

- The following procedure, developed in accordance with Condition B33 and Commitment H1, will be followed in the event of the discovery of finds of possible historical significance during the construction of the Broken Hill Solar PV Power Station:
 1. Should any previously unidentified historical objects be revealed during construction activities, work in the immediate area would cease immediately
 2. Immediate notification to the AGL Project Manager and the Heritage Office (in accordance with the *Heritage Act 1977*) will be undertaken.
 3. Work in the vicinity of the find will not recommence until written authorisation is received from the Heritage Office.
- An Incident Report shall be prepared by the Site Environmental Advisor.

12.3.2 Procedures for Dealing with Suspected Human Remains

- In accordance with Commitment H1, the following procedure will be followed in the event of the discovery of suspected human remains during the construction of the Broken Hill Solar PV Power Station:
 1. Should any suspected human remains be revealed during construction activities, work in the immediate area would cease immediately.
 2. Immediate notification to the AGL Project Manager, Heritage Office (in accordance with the *Heritage Act 1977*) and the NSW Police will be undertaken.
 3. Work in the vicinity of the find will not recommence until written authorisation is received from the Heritage Office or the NSW Police (whichever is the most relevant to the discovery).
- An Incident Report shall be prepared by the Site Environmental Advisor.

12.3.3 Historical Heritage Induction Processes for Construction Personnel

- In accordance with Commitment H2, all construction personnel and contractors will be provided *Worker Environmental Awareness and Compliance Training*.
- Part of the *Worker Environmental Awareness and Compliance Training* program will include a section specific to heritage issues and the need to understand and comply with the protocol for dealing with the detection of unidentified objects. This Training will be a requirement for

all site personnel, inclusive of sub-contractors and any other persons requiring access to the site for activities that may result in the discovery of heritage objects.

12.3.4 Responsibilities

First Solar Project Manager

- Notifying the AGL Project Manager of unexpected finds
- Sign-off of Incident Report Form-P04
- Advising the Construction Manager when works can recommence
- Advising the Site Environmental Advisor when works can recommence.

Site Environmental Advisor

- Notify the Heritage Office (OEH) of unexpected finds and liaising with Heritage Office with regards to how best to proceed
- Advising the First Solar Project Manager when written authorisation from the Heritage Office has been obtained to recommence work.
- Notifying the First Solar Project Manager of unexpected finds.
- Completion of Incident Report Form-P04.

Construction Manager

- Notifying the Project Manager of unexpected finds.
- Input to Incident Report Form-P04.
- Advising the Supervisors when works can recommence.

Supervisors

- Notifying the Construction Manager of unexpected finds and ceasing all work in the area.
- Input to Incident Report P02.

Construction Personnel

- Notifying the Supervisors of unexpected finds and ceasing all work in the area.
- Input to Incident Report Form-P04.

12.4 Records

- Incident Report Form-P02.

13 Dust and Air Quality Management

13.1 Objectives

The primary air quality impact resulting from construction of the PV Power Station is dust generation. Other potential air quality impacts may be caused by vehicle emissions and burning of organic materials. Therefore objectives of this air quality management plan are to:

- Manage construction related dust emissions so that they do not cause harm or environmental nuisance
- Minimise dust generation from the site, including wind-blown and traffic-generated dust
- Prevent visible emissions of dust from the site
- Minimise air pollutant emissions from vehicles and prevent burning of organic materials on site.

This plan addresses Project Approval Conditions B6 and C2 (n).

This plan incorporates environmental commitments AQ1 to AQ7 of the *AGL/SKM Submissions and Preferred Project Report* (February 2013).

13.2 Environmental Assessment Context

This section summarises the findings of the SKM Environmental Assessment (October 2012) and Director General's Environmental Assessment Report (March 2013) with regard to air quality and dust management. No air quality monitoring has been undertaken in the vicinity of the study area. However, the local air quality is expected to be good due to the predominance of rural land uses, low population density, lack of heavy industry and absence of large urban areas.

However, the construction of the PV Power Station and access roads has the potential to generate dust. SKM (2012) concluded the potential for dust generation during construction is low given that the project does not involve large scale earthworks. Also, the potential for dust impacts on health and amenity is low because of the separation distance between the project site and sensitive receptors.

The Department of Planning and Infrastructure (the Department) recommended the proponent operate the project in a manner that minimise dust generation by identifying and implementing practicable dust mitigation measures including cessation of relevant works, ground covers and use of dust suppressants. A ground cover management plan has also been recommended to stabilise soils and reduce soil erosion. No other air emissions during the construction phase were identified for environmental management.

13.3 Dust Control Strategy

13.3.1 Overview

There is the potential to generate nuisance dust from a number of sources, including site preparation works for the array area that forms the majority of the development. Vegetation clearing, topsoil stripping, earth moving and stockpiling are major sources of fugitive dusts. The site preparation strategy (including cut/fill model) has been described in Section 10, Soil and Water Management Plan but the overall approach is to minimise removal of ground cover and retain soil structure as much as possible, by slashing to reduce vegetation height to enable works, rather than removal.

At Broken Hill, the soil naturally contains high levels of lead and zinc. Therefore, dust generation at this site also presents a potential risk of increased exposure to lead and zinc contaminated particulates (either airborne fine particulates or deposited dusts closer to the source). The potential exposure of the Broken Hill township and residences to airborne dusts is low given the distance between locations but higher for workers on the site. However, to inform this plan (as well as health and safety requirements) a grid-based soil sampling strategy will be implemented to characterise the background lead and zinc levels in soils.

13.3.2 Dust Generation Sources

The potential sources of dust generation during construction of the PV Power Station are:

- Traffic generated dust by vehicle movements on unsealed roads e.g. transport of construction workers, delivery of materials to the site, removal of waste materials from the site
- Dust generated by construction activities e.g. vegetation clearance, earthworks for access roads, parking areas, buildings and switchyard, minor grading across the site, soil and vegetation stockpiling, excavation of construction water pond, trenching for cables and excavation of drainage channels.

13.3.3 Control Strategy

The control strategy is designed to meet the requirements of AQ1:

- During construction and operation, all exposed surfaces will be monitored for dust generation, and appropriate dust suppression measures, such as watering, revegetation or application of environmentally acceptable dust suppressant chemicals will be implemented as required.

The general approach to dust control is to:

- Monitor weather conditions on a daily basis, including wind speeds, humidity and rainfall.
- Monitor all exposed surfaces for dust generation
- Implement appropriate dust suppression measures as required:
 - Site traffic control
 - Limiting cleared areas

- Watering sprays
- Vegetative and/or physical stabilisation.
- Chemical stabilisation products will be evaluated if the above dust suppression measures do not prevent visible emissions of dust from the site and there is a risk to the construction schedule caused by cessation of activities during windy conditions.

13.3.4 Construction Water Supply

Water will be supplied to the site during the construction phase by Essential Water (the responsible water supply authority in Broken Hill) using a temporary pipeline cut-in to an existing water main. The temporary water supply pipeline will be 2.7 km long and connect from the mains water pipeline (near the Barrier Highway) to a standpipe located in the northern corner of the site. The pipeline sizing was based on water supply of 150 kL/day. This water will be piped to a construction water pond (located on the northern boundary) and used for dust suppression during construction, as well construction raw water. The location of the dust control water pond is shown in Figure 3.

13.4 Dust Suppression Measures

13.4.1 Traffic Generated Dust

The measures to control dust generation on unsealed roads are:

- Implement the Worker Environmental Awareness and Compliance (WEAC) Training for all site personnel (refer Appendix B)
- Designate access and internal roads and preventing access to sensitive areas, which will be clearly signed
- The access road connecting the Barrier Highway road verge to the project site will be constructed with packed gravel as required to minimise dust and soil impacts
- Compact soil on internal access roads
- Determine site speed limits using a risk assessment process and in accordance with the *First Solar Vehicle Movement Management Plan* and the *Project Site Safety Plan*
- Provide signage and regulate speed limits (see Drawing ABH1 C398, Appendix E).
- Use water trucks to apply sprays at a rate of $\sim 2 \text{ L/m}^2$ or as required for local conditions
- Specify access routes under windy conditions to prevent visible emissions of dust from the site.

13.4.2 Construction Activities

Dust suppression measures are listed below:

- Limit the areas disturbed by construction to the minimum area necessary for the safe conduct of the work involved
- Minimise the area of exposed soil surfaces and the length of time the soil remains exposed by vegetative stabilisation. That is, implementing the *Ground Cover Management Plan* (CEMP Sub-plan B) and undertaking progressive rehabilitation in accordance with the *Rehabilitation and Revegetation Management Plan* (Section 11)
- Stabilise disturbed surfaces and restore as soon as possible using appropriate stabilisation re-vegetation measures
- Control dust generation from any exposed bare ground and soil (or other material) stockpiles under windy conditions using water sprays. An indicative threshold for dust lift-off is wind speed of 5.4 m/s (or 19.4 km/hr) (SEWPaC, 2012¹)
- Manage soil stockpiles and avoid disturbance under windy conditions
- Cease activity if dust suppression measures do not prevent visible emissions of dust from the site.

13.4.3 Vehicle/machinery Emissions and Loads

- Avoid leaving construction vehicles/machinery running or idling when not in use.
- Maintain plant to reduce exhaust emissions.
- Cover vehicular loads of spoil and other erodible material during transport.

13.4.4 Burning

- Do not undertake burning of vegetation or waste material on the construction site.
- Manage bushfire in accordance with the First Solar Bush Fire Management Plan (refer Section 16).

¹ SEWPaC (2012). *National Pollutant Inventory, Emission Estimation Technique Manual for Mining, Version 3.1*. January 2012.

13.5 Corrective Actions

13.5.1 Visible Emissions of Dust from the Site

- Identify the dust source and cease activity until dust emissions are controlled
- Increase water spray rate to a level that controls dust emissions
- Visually monitor the area to ensure effectiveness of increased dust control
- Cease activity if water sprays are ineffective until environmental conditions improve (e.g. reduced wind speed) or identify an alternative method for dust control (e.g. chemical stabilisation).

13.5.2 Complaints Procedure

Dust complaints are to be addressed in accordance with the complaints handling procedure outlined in Section 21. With respect to dust mitigation, the following procedure will be followed:

- Notify the AGL Project Manager
- Implement corrective actions immediately for activities in progress at the time of the complaint, or cease activity
- Identify the cause of dust nuisance if the complaint refers to a past activity and review and update this sub-plan to ensure suppression measures are adequate
- Prepare a Complaint Investigation Report (see complaints management procedure)
- Retrain on-site personnel on their obligations regarding the prevention of visible dust emissions
- Notify the complainant of the findings of the investigation and corrective actions.

13.6 Monitoring

- Review meteorological conditions on a daily basis.
- Visually check for dust emissions at the site boundaries during high wind conditions (e.g. >5.4 m/s).
- Visually check for dust emissions from all exposed surfaces, including the site access road on a regular basis throughout the day.
- Ensure dust suppression measures are adequate for individual construction activities (e.g. as listed in Section 6).

- Record the findings of dust observations throughout the day, any corrective actions and outcomes, in a site diary. This will also provide reference in the event of a dust complaint.
- Record the findings of dust observations on a weekly basis using the Weekly Site Inspection checklist (Form P01, Appendix D CEMP Environmental Management Schedules).

13.7 Responsibilities

Site Construction Manager

- Undertake works in accordance with this plan.
- Monitor weather conditions on a daily basis.
- Daily visual monitoring of dust and air quality at site boundary and along external access road.
- Instruct a stop work order if excessive dust is being generated.
- Identify suitable chemical stabilisers if necessary (in consultation with the Site Environmental Advisor).
- Check construction equipment condition and use to ensure air emissions are minimal.
- Respond to dust complaints.

Site Environmental Advisor

- Complete Complaints Investigation Report (refer Complaints Handling Procedure).
- Monitor weather conditions on a daily basis, including the Bureau of Meteorology (BOM) website (e.g. station 047048 Broken Hill Airport AWS) and the on-site weather station.
- Maintain records of daily weather conditions.
- Daily visual checks of dust and air quality onsite during construction activities.
- Weekly inspections (Form P01, Appendix D CEMP Environmental Management Schedules).
- Respond to complaints in accordance with the Complaints Handling Procedure.
- Undertake checks of vehicles, plant and equipment coming to site in coordination with the Site H&S Manager to ensure all vehicles, plant and equipment coming to site is mechanically sound and with a full service history.

Supervisors

- Record any visual dust emission observations and actions undertaken in a daily diary.
- Supervisors are to respond to visual dust emissions promptly by direct consultation with personnel undertaking the dust generating activity and implementing controls as described in this plan.
- Undertake works in accordance with the Air Quality Management Plan to minimise air emissions.
- Notify the Construction Manager and Environmental Advisor of any potential or actual dust generating activities.

Construction Personnel

- Ensure works are undertaken in accordance with the CEMP to minimise dust and air pollutant emissions.
- Maintain existing ground cover where possible.
- Notify Supervisors of dust issues and any potential dust generating activities.

13.8 Records

The following forms are attached to this CEMP Sub-plan

- Form GC04: Daily meteorological record.

The following forms are included in Appendix E CEMP Environmental Management Schedules:

- Weekly Site Inspections Form-P01
- Complaint Record Form-P02.

14 Dangerous Goods and Spill Response

14.1 Purpose

Dangerous goods and hazardous materials, such as diesel and lubricating and transformer oils will be stored on site during construction of the Broken Hill Solar PV Power Station. This Dangerous Goods and Spill Response Management Plan (Plan) has been prepared to:

- Minimise the risk associated with the use and storage of dangerous goods and hazardous materials during construction
- Minimise the potential for release of dangerous goods and hazardous materials to the environment through appropriate storage and containment
- Provide a procedure for the clean-up of fuels, oils and chemicals in the event of a spill.

This Plan addresses the requirements of the Broken Hill Solar PV Power Station Project Approval (MP10-0202), Condition B5.

This Plan addresses the requirements of the Broken Hill Solar Plant Submissions and Preferred Project Report (SKM, February 2013) commitments HR3, HR4, HR5, HR6, WM6 and W7.

14.2 Standards and Guidelines

Any fuels or chemicals will be stored on the Broken Hill Solar PV Power Station site in accordance with the relevant Australian Standards, including:

- AS1940 *The Storage and Handling of Flammable and Combustible Liquids* (FCL)
- *Storage and Handling Liquids: Environmental Protection Participants Manual*, Department of Environmental and Climate Change (DECC) 2007
- *Australian Dangerous Goods Code 7th Edition* (ADG 7), October 2011
- *Environmental Protection Manual for Authorised Officers: Bunding and Spill Management, technical bulletin*, Environmental Protection Authority (EPA), 1997 (as required by Condition B5(c)).

14.3 Dangerous Goods and Hazardous Materials

14.3.1 Types, Uses and Classification

The list of dangerous goods that may be stored and used on site during construction is provided in Table 8. There will be no petrol stored on site. There will no herbicides stored on site.

A hazardous substances register will list all dangerous goods and hazardous material (DGHM) stored on site. Give that the DGHM used and stored on site will be the same as Nyngan, estimated storage quantities are also provided in Table 9. DGHM specific to Broken Hill are acetylene and oxygen.

Diesel and lubricating oil will be kept onsite for use in site vehicles, plant and machinery.

Transformers will be filled with biodegradable transformer oil (FR3). Where required, transformer oil will be stored on site in accordance with AS 1940 for FCL. Where practicable the holding time for transformer oil on site (prior to use in transformers) will be kept to a minimum.

In accordance with Commitment HR6, all dangerous goods and hazardous materials will be transported to site by licensed contractors.

Table 8: Indicative List of Dangerous Goods to be used during Construction

Name	Dangerous Goods Class	Estimated Quantity
Welding Gas (e.g. Acetylene)	Class 2.2 – Non-flammable, non-toxic gases	6 x Size G cylinders stored at any one time
Oxygen	Class 2.2 – Non-flammable, non-toxic gases	6 x Size G cylinders stored at any one time
Compressed air	Class 2.2 – Non-flammable, non-toxic gases	Est. 6 x Size G cylinders stored at any one time
LPG gas	Class 2.1 – Flammable Gas	Est. 6 x Size G cylinders stored at any one time

Table 9: Indicative List of Combustible Liquids to be used during Construction

Name	Classification	Estimated Quantity
Diesel	C1 – Combustible liquids	20 kL
Lubricating oil (including hydraulic oil)	C2 – Combustible liquids	2 kL
Transformer oil	C2- Combustible liquids	2 kL

14.3.2 Storage

Dangerous goods and hazardous substances shall be stored on site during construction in a manner that prevents and contains spills and therefore reduces the likelihood of release to the environment, including land and downstream watercourses. The storage location of dangerous goods and hazardous materials will also be documented as part of the Bushfire Management Plan (Section 16).

The strategy for storage of dangerous goods and hazardous materials during construction is to:

- Develop a dangerous goods and hazardous materials inventory to include storage volumes and hazardous substances register (e.g. compilation of Safety Data Sheets)
- Construct bunding for dangerous goods and hazardous materials to contain 110% of the volume of the largest single stored volume within the bund
- Document storage volumes and bund dimensions and, assessment against the requirements of AS 1940 and EPA 1997 the Environment Protection Manual for Authorised Officers: Bunding and Spill Management, technical bulletin (Environment Protection Authority, 1997)
- Dangerous goods and hazardous storage areas are to be inspected and certified by a dangerous goods specialist prior to commencement of use, and regularly inspected by project personnel thereafter
- Site Environmental Advisor also to inspect tank prior to use to make sure all control measures are in place (e.g. sump plugs)
- Determine whether storage volumes trigger the requirements for placarding of FCL on site (to inform emergency response agencies).

Diesel will be stored on site for the duration of construction and then removed. Specific management actions for diesel storage are:

- Diesel will be stored in a double lined tank with AS 1940 compliance documentation
- Dedicated spill kits will be provided for this area
- The area will be HDPE lined so that any spills during refilling can be captured.

Specific management actions to be undertaken for storage of dangerous goods and hazardous materials during construction are:

- Store (and handle) dangerous goods at least 50 metres away from watercourses, drainage lines or permanent water sources
- As far as practicable, store smaller quantities of compatible dangerous goods and hazardous materials in a dedicated dangerous good store in the main site compound

- Store dangerous goods and hazardous materials in approved containers (e.g. jerry cans) within the specified bunded areas/store. All storage containers shall be clearly marked and approved for the specific use
- Provide a mobile spill kit to be located near the dangerous goods storage area to clean up any spill outside of the bunded area. The mobile spill kit will contain as a minimum:
 - Absorbent pads, socks and pillows
 - PPE equipment (goggles, gloves)
 - Disposal bags.
- Contain and treat spills in accordance with the relevant SDS. Advise all site personnel of the type, location and use of dangerous goods and hazardous materials in the *Worker Environmental Awareness and Compliance Training (WEAC)*.
- Install portable bunds to contain any spills from generators used on site.

Based on the previous flood monitoring conducted for the site (refer to section 9.2.2), there is limited risk on the site from flooding, and therefore limited risk to stored dangerous goods. Where feasible, as an additional precaution, fuels and chemicals will be stored in locations that are located above the 100 ARI level.

14.3.3 Handling

General

Employees using dangerous goods or hazardous materials shall be given information, instruction, supervision or training in the following:

- Identification, properties and potential hazards of dangerous goods and hazardous materials including access to the Safety Data Sheets (SDS)
- Correct use, fitting and storage of personal protection equipment
- Correct procedures for safe storage and handling of dangerous goods or hazardous materials
- Emergency procedures in case of a spill, leak, fire or explosion.

The above process will be undertaken in coordination with the First Solar Health and Safety Manager.

All site personnel will be advised of the type, location and use of dangerous goods and hazardous Materials in the *Worker Environmental Awareness and Compliance Training (WEAC)*.

Waste oils, greases and chemicals generated during construction will be disposed of or recycled in accordance with the *Waste Management Plan*. In accordance with Commitment W7 where waste oils, greases and chemicals require storage onsite prior to disposal, these waste items will be stored in bunded areas with a minimum volume requirement of 110% of the volume of the largest single stored volume within the bund.

Equipment refuelling

SKM (2013) reports a commitment for major plant and equipment to be refuelled off-site or by a mobile mini fuel tanker.

However, First Solar proposes to store diesel fuel on site in a storage tank of approximately 20 kL volume. The storage tank will be established and constructed in accordance with AS 1940 and located within the main site compound. A mobile min fuel tanker may also be used. Storage and bunding considerations include:

- Design so as to minimise fire and accident risks
- Specific design for emergencies including fire fighting facilities
- Bund capacity
- Safe access to and egress from all working locations
- Avoidance of ignition sources
- Spill control measures, including for dispensing fuel.

The deviation from the requirements of Commitment HR5 (off-site refueling) is to:

- Avoid an increased volume of vehicles between the site and Broken Hill for refuelling purposes
- Control over onsite refuelling locations. Having set refuelling locations for the mobile fuel tanker to stop at will allow environmental controls to be implemented at these locations.

Machinery with limited mobility (e.g. post pounders) will be moved to the end of array areas for refuelling with a mobile fuel tanker (or equivalent). Equipment and machinery that cannot be moved (e.g. generators) will be refuelled in-situ by a mobile fuel tanker (or equivalent) or using jerry cans.

The following controls will be put in place at the designated mobile fuel tanker (or equivalent) refuelling sites for mobile plant and machinery:

- Refuelling to be undertaken at least 50 metres away from watercourses, drainage line or permanent water sources
- Funnels, extended nozzles or quick release nozzles shall be used to minimise fuel spillage when fuelling equipment
- Drip trays will be used when filling machinery
- Spill kits will be available during refuelling activities
- Any spills will be managed as detailed in Section 14.4.

First Solar will utilise appropriately trained operators for refuelling activities. Refuelling will not be undertaken by onsite personnel who have not received training on the correct refuelling procedure.

Training of designated refuelling operators will be managed by the onsite First Solar Health & Safety Manager.

Filling transformers with transformer oil

Control measures will include:

- Drip trays / spill containment units will be used during the filling of transformers
- One wheelie bin type spill kit will be available during transformer filling activities
- The temporary earth bund will be removed one day following the filling operations.

Transformers (containing transformer oil) will be banded in accordance with the requirements of AS1940.

14.4 Spill and Emergency Response

14.4.1 Spill

The following process will generally be followed by onsite personnel in the event of a spill of a dangerous goods or hazardous materials:

1. Ensure the safety of self and others in the area
2. If safe to do so, shut down/isolate the spillage source
3. Report the incident to your Supervisor and Site Environmental Advisor
4. Contain the contaminant of spillage using, spill kits, earth or other available measures if safe to do so
5. Prevent the spill from entering drainage lines or permanent water sources (including the existing onsite dam and the dust water suppression pond) using spill kits, diversion drains or other method appropriate to prevent the flow of a dangerous goods or hazardous materials.

For spills of dangerous or hazardous materials that present combustion risk:

- Identify potential ignition sources in the surrounding area
- Secure potential sources of ignition either by removal or isolation
- Shut down non-essential plant in the immediate area
- Stop hot work in the immediate area
- Do not smoke or cause sparks adjacent to spills
- Remain at the scene until made safe:
 - Provide further help if required

- If a witness to incident provide information to the Site Environmental Advisor for incident report.

The affected area should not be hosed down. Clean-up of contaminant to be undertaken as a priority once it has been contained and it is safe to do so. Clean-up of contaminated areas will be undertaken under the supervision of an appropriately experienced person (e.g. the Site Environmental Advisor).

Both “portable” and “wheelie bin” style spill kits will be available on site. All onsite spill kits will be “general purpose” kits, except where the need for specialist kits is identified. General purpose spill kits are suitable for use for the following:

- General workshop liquids
- Oils, fuels and solvents
- Agricultural chemicals.

Based on the Dangerous Goods and Hazardous Materials anticipated to be on site (as cited in Section 14), it is not expected that specialist spill kits will be required. Should First Solar need to store dangerous goods or hazardous materials that cannot be controlled with a “general purpose” spill kit, a specialist kit will be procured.

General Purpose “wheelie bin” sized spill kits will indicatively include:

- Absorbent pads
- Spill containment booms
- General purpose absorbent
- PPE
- Contaminated waste bags and ties
- Instruction sheets.

Spill kits (including spares) will be checked for currency in accordance with manufacturer's specifications and replaced when necessary. Inspection of dangerous goods areas will be on a weekly basis and included in weekly checklist.

Small volumes of diesel contaminated soil (e.g. <math><1\text{ m}^3</math>) could be bioremediated on site with controls (lining, bunding, diversion of stormwater and covered) or disposed at licensed waste facility. The Wills Street Landfill and Waste Depot provides discrete areas for disposal of clinical, contaminated waste and hazardous items and may accept small quantities of diesel contaminated wastes. However, approval must be sought from the facility prior to disposal and consultation with them has indicated they do not accept contaminated soil and the nearest licensed receival facility is likely to be in Adelaide.

Any spill to soil will be deemed to be contaminated unless the volume is such that testing is required to characterise the level of contamination, and therefore cost of disposal to licensed waste facility.

Reporting of the incident will be undertaken by the Site Environmental Advisor in accordance with the *Incident Management Protocol*.

Spills of dangerous goods or hazardous substances, where the spills trigger notification under Condition C8 of the Broken Hill Project Approval, notification will be in accordance with the *Incident Management Protocol*.

14.4.2 Emergency

For life threatening emergencies, the first response is to call 000. Emergency contacts in the event of fire or off-site release of dangerous goods and hazardous materials are listed below.

The appropriate local Rural Fire Service (RFS) contact is the Zone Manager, Far North Zone (contact details below):

Chris Favelle
Manager – Far West
Phone: (02) 6836 1226
E-mail: Chris.favelle@rfs.nsw.gov.au
Please call 000 for all emergencies
<http://www.farwest.rfs.nsw.gov.au/>

The Broken Hill Fire Station is located within the Broken Hill Township and is the likely first responder to bushfires within the area due to their proximity in comparison to the RFS. The appropriate contact details at the Broken Hill Fire Station are:

Firefighter Gary Price
02 8087 4419.

14.5 Responsibilities

AGL Project Manager

- Any community and/ or media updates.

First Solar Site Project Manager

- Coordination of emergency to a dangerous goods or hazardous materials spill.
- Notification to AGL Project Manager.
- Provision of adequate resources and materials to clean up spills and prevent off site migration.

First Solar Site Construction Manager

In the event of a spill that triggers notification under Condition C8 *Incident Reporting*, the First Solar Construction Manager will be responsible for the items outlined in the *Incident Management Protocol*.

The First Solar Construction Manager is responsible for reporting to the Department of Planning and Infrastructure (DoPI) and the EPA. Reporting to these agencies is required if the incident causes or threatens to cause environmental harm. As a guide:

- any release to a watercourse could be considered to cause environmental harm
- any release to land that extends beyond the project boundary or soil testing shows exceeds contaminated land guidelines could be considered to cause environmental harm.

The First Solar Construction Manager is also responsible for:

- Advising the Site Environmental Advisor of an environmental incident.
- Working with the Site Environmental Advisor to respond to and implement corrective actions for environmental incidents.
- Directing corrective action if required.
- Management of dangerous goods inventory.
- Maintenance of SDS Register.

First Solar Site Environmental Advisor

- Where notification is required, advising the First Solar Project Manager of the details of the environmental incident to facilitate notification requirements to AGL Project Manager.
- Completion of Incident Register) and Incident Report.
- Follow up and sign off of Incident Report.
- Maintenance of incident records.
- Directing corrective action if required / supervision of site clean up.
- Undertaking environmental investigations required if dangerous goods or hazardous substances are released to the environment.
- Site inspections in accordance with the Weekly Site Inspections.

First Solar Site Supervisors

- Ensuring works are undertaken in accordance with the CEMP to minimise the potential for spills.
- Notifying the Site Environmental Advisor of any spills or incidents with Dangerous Goods or Hazardous Materials.
- Immediate onsite containment of spills as far as practicable.
- Reviewing relevant SDS's prior to use of dangerous goods or hazardous materials.

Construction Personnel

- Ensuring works are undertaken in accordance with the CEMP to minimise the potential for spills.
- Reviewing relevant SDS's prior to use of dangerous goods or hazardous materials.
- Notifying their supervisor of any spills or incidents with dangerous goods or hazardous materials.
- Immediate onsite containment of spills as far as practicable.

14.6 Records

- Worker Environmental Awareness and Compliance Training (Attachment CEMP-03).
- Incident Register Form P03 (refer Appendix D).
- Event Notification and Investigation Report Form-P04 (refer Appendix D).
- SDS for dangerous goods and hazardous materials stored on site (refer to First Solar Project Site Safety Plan).

15 Waste Management

15.1 Objectives

The objectives of this waste management plan are to:

- Minimise the production of waste materials and maximise diversion from landfill by reuse and recycling in accordance with the waste management hierarchy (avoid, reduce, re-use, recycle, recover, treat and dispose)
- Ensure appropriate disposal of wastes
- Maintain the site in a clean and tidy state to reduce the attraction of pest species, impacts on the local environment and negative impacts on visual amenity
- Dispose of regulated wastes (e.g. waste oil) in accordance with Australian legislative requirements and environmental best practice (refer CEMP Sub-plan K *Dangerous Goods and Spill Response Plan*).

This plan addresses Project Approval Conditions B11, B12, B13 and hazardous waste management.

This plan addresses commitments W1 to W10 of the SKM Submissions and Preferred Project Report (February 2013).

15.2 Broken Hill City Council Landfill and Waste Depot

The Broken Hill City Council provides local waste and recycling facilities at the Broken Hill Landfill and Waste Depot in Wills Street, Broken Hill. Services include:

- Recycling (e.g. glass, plastics, aluminium)
- Oil recycling facility
- Green waste disposal
- General waste (e.g. putrescible waste)
- Special waste (e.g. waste tyres).

Where practicable, First Solar will use local facilities to minimise transportation and to ensure the regular removal of waste from site. First Solar will work with the Broken Hill City Council to ensure consistency of approach and to minimise impact on the Council's provision of local waste services.

15.3 Waste Types

15.3.1 Overview

The following section identifies the types of waste expected to be generated during the construction phase of the Broken Hill Solar PV Power Station, and the intended methods of disposal. Effective onsite waste management and control is an important facet in managing:

- Onsite pests, e.g. rodents
- Human health and hygiene
- Contamination risk, e.g. from waste oils associated with plant and equipment
- Presence of onsite combustible fuel loads.

15.3.2 Waste Types and Disposal

Table 10 summarises the waste types that will be generated during the construction phase for the Broken Hill Solar PV Power Station and access tracks (both temporary and permanent). Table 10 also lists the waste classification for each waste type in accordance with *Waste Classification Guidelines* (Department of Environment, Climate Change and Water, 2009) and how each waste type will be managed.

As required by Condition B11 of the Project Approval, First Solar will ensure all waste materials removed from the site shall only be directed to a waste management facility of premises lawfully permitted to accept the materials.

The disposal facilities that have been cited are indicative. Where First Solar identifies a more 'environmentally friendly' alternative (that is lawfully permitted to accept the waste type) to the cited disposal option these alternatives will be investigated and utilised as far as practicable. The transport of wastes to recycling or waste disposal facilities will be undertaken by an appropriately licensed waste transporter.

15.3.3 External Waste

In accordance with Condition B12, waste generated outside of the Broken Hill Solar PV Power Station site will not be received at the site for storage, treatment, processing, reprocessing, or disposal on the site.

No licence to manage external waste will apply to the project.

Table 10: Waste Types and Management

Waste Type	Waste Classification	Generated from	Management strategy	End use
Mixed putrescible waste	General solid waste (putrescible)	Site personnel	<ul style="list-style-type: none"> Collected in mixed putrescible waste bins positioned around the site. Collected on a weekly basis or as required. 	Wills Street Landfill and Waste Depot
Dry recyclables (plastic, glass bottles, aluminium and steel cans, cardboard, paper)	General solid waste (non-putrescible)	Site personnel Construction office	<ul style="list-style-type: none"> Collected in recycling bins positioned around the site. Collected on a weekly basis or as required. 	Wills Street Landfill and Waste Depot
Cardboard	General solid waste (non-putrescible)	Packaging from the PV panels	<ul style="list-style-type: none"> Compressed and bound on site using a compactor. Collected on a weekly basis or as required. 	The project will generate large amounts of cardboard waste. The objective will be to seek a recycler or other re-use for these materials prior to commencement of construction.
Steel	General solid waste (non-putrescible)	<ul style="list-style-type: none"> Excess steel from post and tilt tray construction. Packaging straps. Metal brackets. 	<ul style="list-style-type: none"> Stored in segregated stockpiles in laydown areas. Removed by steel recycling contractor as required. 	Steel recycler (e.g. Channings)
Timber/wood	General solid waste (non-putrescible)	Pallets	<ul style="list-style-type: none"> Stored in segregated stockpiles in laydown areas. Removed to facility where it can be recycled. 	Recycled where practicable (e.g. Channings)
Electrical wastes	General solid waste (non-putrescible)	Cabling offcuts Cable reels	<ul style="list-style-type: none"> Stored in segregated stockpiles in laydown areas. Removed by steel recycling 	Steel recycler (e.g. Channings)

Waste Type	Waste Classification	Generated from	Management strategy	End use
Equipment leaks mixed with soil	General solid waste (putrescible)	Spills/leaks of hydraulic fluids, diesel, transformer oils or machinery oil	<p>contractor on a 6 monthly basis.</p> <ul style="list-style-type: none"> Contaminated area dug up and bagged in appropriate regulated waste bags. Stored in a regulated waste bin. Assess if soil can be stored on site and remediated prior to being disposed of. 	<p>Subject to testing non-contaminated soil can be used at Wills Street Landfill Waste Depot</p> <p>If contaminated, disposal to be undertaken in line with EPA guidelines at an appropriate facility in the Adelaide area.</p> <p>Permission from the EPA for bioremediation of small volumes of soil on site could also be considered.</p>
Used rags mixed impregnated with hydraulic fluids	General solid waste (putrescible)	Clean-up of spills/leaks of hydraulic fluids, diesel, transformer oils or machinery oil	<ul style="list-style-type: none"> Deposited of in regulated waste bin. 	Wills Street Landfill and Waste Depot
Spray cans	General solid waste (putrescible)	Construction activities	<ul style="list-style-type: none"> Deposited in on-site bins. 	Wills Street Landfill and Waste Depot
Vegetation	General solid waste (putrescible)	Clearing	<ul style="list-style-type: none"> Stored in segregated stockpiles in laydown areas. Removed to landfill. 	<p>Used on site in accordance with W3: site restoration and landscaping or wind-rowed along the edges of the transmission line easement.</p> <p>or</p>

Waste Type	Waste Classification	Generated from	Management strategy	End use
				Australian Vermiculture (AV) – organics processing contractor or Wills Street Landfill and Waste Depot
Building rubble	General solid waste (non-putrescible)	<ul style="list-style-type: none"> • Building waste. • Broken module pieces mixed with soil. • Demolition waste – mowing, grubbing and construction debris waste (concrete/wood.) 	<ul style="list-style-type: none"> • Stored in segregated stockpiles / bins in laydown areas. • Removed to landfill as required. 	Wills Street Landfill and Waste Depot
Used machinery oils	Regulated	On-site machinery maintenance	<ul style="list-style-type: none"> • Collected in drums / storage containers. • Stored in bunded areas within the laydown area. • Deposited in regulated waste bin. 	Wills Street Landfill and Waste Depot
Batteries	General solid waste	Lead acid and NiCd batteries	Segregated on site and removed to landfill facility.	Wills Street Landfill and Waste Depot
Domestic effluent	Liquid	Site amenities	<ul style="list-style-type: none"> • On-site effluent management system for main office. • Portable chemical toilets regularly serviced under contract. 	On-site disposal Pump out to Essential Water Sewage Plant

15.4 Waste Management

15.4.1 General Wastes

- All site personnel will be advised of the Waste Management Plan in the Worker Environmental Awareness and Compliance Training (refer to Attachment CEMP-03).
- All site personnel will be encouraged to separate waste streams to maximise recycling opportunities.
- General wastes will be segregated into recyclable and non-recyclable streams through the provision of appropriate bins on the construction site.
- No waste burnt or buried on site.
- Combustible fuel loads will be managed onsite to ensure compliance with the *Bushfire Management Plan* (refer to CEMP Sub-plan M).
- Securely covered, clearly labelled segregated waste and recycling bins will be provided at strategic locations adjacent to the site construction site office(s) and amenities area.
- Site bins will be inspected weekly by the Site Environmental Advisor in accordance with Form P01 *Weekly Site Inspections* (Attachment CEMP-04 *Plan Environmental Management Schedules*).
- General waste and recycling bins will be emptied weekly, or as required.
- Onsite general waste and recycling bins will have lids.
- Specialist stockpiles will be segregated (e.g. steel, timber) and removed as required.
- Inspection for site litter is included in the weekly inspection checklist Form P01 *Weekly Site Inspections*.
- Invasive weeds will be collected in plastic bags to the extent possible and disposed of at a licensed green waste disposal facility or landfill.
- All non-regulated waste leaving the site will be recorded with on site waste register. Form G01 will track the waste type and quantity of non-regulated waste removed from site.
- The transport of wastes will be undertaken by a licensed waste transporter.
- The disposal of any hazardous materials will be tracked by waste receipts.

15.4.2 Spoil Management

- Topsoil will be stockpiled and reused on-site for rehabilitation. Excess topsoil generated during the construction activities will be retained for use in rehabilitation.
- Section 10 Soil and Water Management Plan details soil management measures.
- Soils contaminated through fuel or chemical spills will be excavated and transported to a licensed waste facility and the resulting excavations will be backfilled with clean soil.

15.4.3 Liquid Waste Management

- During the construction phase, flushing toilets will be available at the site buildings. The liquid waste from the flushing toilets will be captured within a holding tank and removed from site by an appropriately qualified sub-contractor for disposal at a Essential Water Sewage Plant.
- Chemical toilets will be provided around the site for use by construction personnel during the day. Where possible these toilets will be located on a trailer to allow for easy re-location. Waste from portable toilets will be disposed off-site at Essential Water Sewage Plant.
- Onsite grey water generated from kitchen and shower facilities will be captured within a holding tank and removed from site by an appropriately qualified sub-contractor for disposal at Essential Water Sewage Plant.
- Waste oils, greases and chemicals generated during construction will be stored in appropriately banded areas prior to their removal for recycling or disposal.
- Regulated liquid waste, e.g. waste oil, will be disposed at appropriately licensed facilities (e.g. Broken Hill Landfill and Waste Depot).

15.4.4 Hazardous Wastes

Hazardous waste is classified by the NSW Environmental Protection Agency (EPA) and includes the following:

- Containers, having previously contained a substance of Australian Dangerous Goods (ADG) Class 1 (explosives), 3 (flammable liquids), 4 (flammable solids), 5 (oxidising substances) or 8 (corrosives) within the meaning of the Australian Dangerous Goods Code (ADG), or a substance to which Division 6.1 of the ADG applies, from which residues have not been removed by washing or vacuuming

- Coal tar or coal tar pitch waste (being the tarry residue from the heating, processing or burning of coal or coke) comprising of more than 1% (by weight) of coal tar or coal tar pitch waste
- Lead-acid or nickel-cadmium batteries (being waste generated or separately collected by activities carried out for business, commercial or community services purposes)
- Lead paint waste arising otherwise than from residential premises or educational or child care institutions
- Any mixture of the wastes referred to above.

The only ADG Class 1,3,4,5 or 8 substances that may be stored on site are petrol (Class 3). For the purposes of this plan, any containers used to store diesel (which is a Class C1 Combustible Liquid), will be treated the same as petrol.

Fuel containers will be reused as far as practicable. Where First Solar needs to dispose of a fuel container, the container will be disposed of in accordance with EPA guidelines for hazardous waste.

15.4.5 Demobilisation Waste Removal

At the conclusion of the construction phase, First Solar will removal all waste attributable to the construction of the power station, from the site. These wastes will be sorted for reuse where feasible or transferred to the Wills Street Land and Waste Depot.

15.5 Responsibilities

Site Construction Manager

- Management of onsite waste generation associated with construction works to reduce quantities where practicable.
- Management of onsite soils in accordance with CEMP-Sub-plan G *Soil and Water Management Plan*.
- Management of onsite combustible fuel loads in consultation with the Site Environmental Advisor.
- Compliance with the onsite waste separation systems in place.

Site Environmental Advisor

- Weekly site inspections (see Form P01).
- Maintain the waste register on Form GC05.

- Review waste management records and opportunities to avoid, reuse and recycle waste on a regular basis in consultation with the Site Construction Manager.
- Manage onsite waste management, including the management of waste pick-ups.
- Management of onsite combustible fuel loads in consultation with the Construction Manager.
- Compliance with the onsite waste separation systems in place.

Supervisors

- Management of onsite waste generation associated with construction works to reduce waste quantities where practicable.
- Notification to the Construction Manager of any activity that may generate a large amount of waste to allow appropriate controls to be put in place.
- Compliance with the onsite waste separation systems in place.

Construction Personnel

- Compliance with the onsite waste separation systems in place.
- Notification to Supervisors of any activity that may generate a large amount of waste to allow appropriate controls to be put in place to manage waste generated.

15.6 Records

- Weekly inspection Form P01 (refer to Attachment CEMP-04 *Plan Environmental Management Schedules*).
- Non-regulated waste register Form-GC05.

16 Bushfire Management

16.1 Objectives

The objectives of this Bushfire Management Plan are to:

- Manage construction related dust emissions so that they do not cause harm or environmental nuisance
- Define appropriate measures and processes to minimise ignition and bushfire related risks during the construction of the Broken Hill Solar PV Power Station
 - Confirm the intent to continue to engage with the Rural Fire Service (RFS) in the implementation of this Management Plan as the Broken Hill Solar PV Power Station construction schedule progresses
 - Provide a monitoring, auditing and reporting framework to ensure the effectiveness of the bushfire controls implemented.

This Bushfire Management Plan for the Broken Hill Solar PV Power Station has been prepared to meet applicable requirements of Project Approval (MP10_0202) conditions B3 and B4 and mitigation measure HR2 of the Broken Hill Solar Plan Submissions Report (SKM, February 2013).

16.2 Scope

16.2.1 Overview

As required by the Project Approval (Application No. MP10_0202) for the Broken Hill Solar PV Power Station, First Solar (Australia) Pty Ltd (First Solar) has developed the following Bushfire Management Plan for the development as it relates to the activities of First Solar. Specifically this Bushfire Management Plan relates to the construction phase of the power station and associated power station access tracks. This First Solar *Bushfire Management Plan* should be read in conjunction with the First Solar *Emergency Response Plan*.

The approach First Solar will adopt in relation to bushfire is as follows:

- Avoidance and control of potential ignition risks in accordance with the *Bushfire Management Plan*
- Maintain an asset protection zone / external perimeter access around the power station
- Formalise site access for RFS / Broken Hill Fire Station in the event of an emergency
- Extinguishment of fires where practicable and safe to do so using onsite fire extinguishers
- Safe evacuation from site in the event of a fire
- Dial 000 in the event of uncontrolled fire
- Collaboration with the NSW Rural Fire Service (RFS) to manage any uncontrolled fires on site.

16.2.2 Background

The Broken Hill region is characterised by a warm to hot, persistently dry desert climate, which generally presents a high bushfire risk. There has, however, been no recorded bushfire or wildfire activity in the area since 2007. Given that the proposed project site is sparsely covered with low lying shrubs and there is no bushland located adjacent to, or in the surrounding area, it is not considered to be a bushfire prone area (SKM, 2013).

16.3 Design

In accordance with Condition B3, First Solar shall ensure that all development components on site are design and constructed and operated to minimise ignition risks and provide for asset protection. The key design guidelines are NSW RFS design guidelines *Planning for Bushfire Protection 2006* and *Standards for Asset Protection* although these guidelines refer to assets in bushfire prone areas.

Planning for Bushfire Protection 2006 provides Bush Fire Protection Measures (BFPMs) that have been incorporated in the site layout civil design. These measures include:

- The provision of clear separation of buildings and bushfire hazards, in the form of fuel reduced Asset Protection Zones (APZs) – which in this case is the 6 metre perimeter road between the solar power station and the project site boundary
- Appropriate access for fire fighters, including the site access road (compacted gravel) and the perimeter road
- Access to water from the construction dust control pond, if required
- Emergency management arrangements for fire protection and / or evacuation.

16.4 Mitigation Measures

General mitigation measures are:

- All construction work will be carried out in accordance with standard procedures, practices and guidelines for bushfires for solar power stations (note this CEMP does not include the power transmission line).
- The risk of fire and its prevention would be part of the Hazard Identification, Risk Assessment and Control process to be carried out prior to work commencing.
- All site staff will be trained in how to prevent, control and survive bush fires.
- Work vehicles would be equipped with appropriate bushfire control equipment
- No burning of vegetation or waste material to take place on the site.

The bushfire risks described in Section 10.2.2 of the EIS and control measures are listed in Table 11.

Table 11: Identification and Control of Bushfire Risks, Broken Hill Solar PV Power Station

Risk	Control
Smoking and inappropriate disposal of cigarettes on site	Designated smoking areas. <i>Worker Environmental Awareness and Compliance Training.</i>
Grinding, mowing, slashing and using a petrol powered chainsaw	Construction vehicles/machinery would not be left running or idling when not in use. Construction plant would be fitted with appropriate emission controls and would undergo
Welding and soldering activities	Welding and soldering activities to be undertaken away from possible fuel loads, e.g. vegetative and waste. Controls as per First Solar Project Site Safety Plan.
Using a petrol, LPG or diesel powered motor vehicle over land containing combustible material	Works to be minimised as far as practicable. Vehicles to be restricted to formed access tracks (in accordance with <i>Soil and Water Management Plan</i>). Battery powered machinery to be used if possible.
Using a mobile plant fitted with power hydraulics on land containing combustible material	Works to be minimised as far as practicable Maintenance of machinery.
Using a gas torch to apply heat shrink cable products	Activity separated from flammable or combustible materials.

16.5 Preventative Actions

16.5.1 Constantly Monitor and Advise Fire Danger Status

- The fire danger status shall be obtained through the RFS website:
http://www.rfs.nsw.gov.au/dsp_content.cfm?cat_id=1109.
- The fire danger status will be communicated at the First Solar onsite sign-in register daily.
- Broken Hill is located in Zone “Far West” on the NSW Rural Fire Service “Total Fire Ban and Current Fire Danger Map”.

16.5.2 Adhere to Total Fire Ban rules

The *Rural Fires Regulation 2008* states:

A person must not, in connection with any agricultural, pastoral or other land use, drive or use in any grass, crop or stubble land any motorised machine unless:

- *the machine is constructed so that any heated areas will not come into contact with combustible matter, and*
- *the machine is maintained in a good and serviceable condition so as to prevent the outbreak of fire.*

A person must not, in connection with any agricultural, pastoral or other land use:

- *drive or use in any grass, crop or stubble land, a motorised machine on which it is practicable to carry prescribed fire safety equipment, or*
- *carry out welding operations or use explosives or an angle grinder or any other implement that is likely to generate sparks, unless the person carries on the machine, or has in the vicinity, prescribed fire safety equipment that is maintained in a serviceable condition.*

First Solar will implement appropriate controls with respect to machinery maintenance to ensure compliance with the above provision.

16.5.3 No Intentionally Lit Fires for Any Purpose

No fires will be intentionally lit within the Broken Hill Solar PV Power Station site or in areas associated with the power station access tracks for any purpose.

16.5.4 Extinguish and/or Contain When Safe To Do So

Pursuant to the *Rural Fires Act 1997* (RFA, 1997):

- *It is the duty of the owner or occupier of land to take notified and practicable steps to prevent the occurrence of bushfires on, and to minimise the danger of the spread of bushfires on or from, that land;*
- *If a fire (not being a fire or part of a fire lit under the authority of this Act or any other Act) is burning on any land at any time during a bushfire danger period applicable to the land the occupier of the land must:*
 - *immediately on becoming aware of the fire and whether the occupier has lit or caused the fire to be lit or not, take all possible steps to extinguish the fire, and*
 - *if the occupier is unable without assistance to extinguish the fire and any practicable means of communication are available, inform or cause to be informed an appropriate officer of the existence and locality of the fire if it is practicable to do so without leaving the fire unattended.*

First Solar will have fire extinguisher equipment available in all onsite vehicles. The management and maintenance of this equipment will be undertaken in accordance with the First Solar Project Site Safety Plan. First Solar will only utilise fire extinguishers for life safety evacuations or for putting out small fires where the operator has been trained in the use of the fire extinguisher.

Any fire incident would be appropriately recorded in the Event Notification and Investigation Report.

16.5.5 Storage of Fuel and Combustibles

During work hours fuels and combustible materials that present an ignition risk are to be stored and used in accordance with the manufacturer/suppliers recommendations, including the availability of fire-fighting equipment. Where applicable, First Solar will ensure that fuels and combustible materials that present an ignition risk are also stored in accordance with CEMP Sub-plan K *Dangerous Goods and Spill Response Plan* and the relevant Australian Standard including:

- *AS 1940 The Storage and Handling of Flammable and Combustible Liquids*
- *AS 3780 The Storage and Handling of Corrosive Substances*
- *AS/NZ 4452 The Storage and Handling of Toxic Substances*
- *Storage and Handling Liquids: Environmental Protection Participants Manual, 2007* (Department of Environment and Climate Change, DECC)
- *Environmental Compliance Report: Liquid Chemical Storage, Handling and Spill Management; Part B, Review of Best Proactive and Regulation, 2005.* (Department of Environment and Conservation, DEC).

Upon the cessation of work for the day all portable fuels and like products must be returned to the main site compound and appropriately stored in the designated area (as far as practicable). This designated area will be sign posted "Fuel Storage Area" and appropriate controls such as fire-fighting equipment made available to the fuel storage area. The fuel storage area will be free of grass and other combustible material.

16.5.6 Specific Controls

The following measures would be adopted to minimise bushfire related risks throughout the Construction Phase for the Broken Hill Solar PV Power Station and associated access tracks:

- A 6 metre fire break/perimeter access track will be implemented around the boundary of the site to form an Asset Protection Zone (APZ)²
- Motorised equipment would not be driven in heavily vegetated / grassed areas unless that machine is constructed so that any heated areas do not come in contact with combustible materials
- All machines and equipment would be maintained in a good and serviceable condition
- All plant and equipment accessing the Broken Hill PV Power Station site, and activities that could generate sparks (i.e. welding and use of angle grinders), would require ready access to prescribed fire safety equipment
- Prescribed fire equipment could include:
 - knapsack spray pump of 16 litre capacity filled with potable water (potable water supply provided on site)
 - fire extinguisher (liquid type) of 9 litre capacity or dry powder type extinguisher of 0.9 kg capacity)
- During construction, trailer mounted water tankers with fire fighting pumps and spray hoses would be available on site at all times
- Throughout construction, the areas immediately around infrastructure would be managed to prevent the build-up of combustible materials
- Waste will be removed from site in accordance with CEMP Sub-plan L *Waste Management Plan*.

² An APZ is a buffer zone between a bush fire hazard and buildings, which is managed progressively to minimise fuel loads and reduce potential radiant heat levels, flame, ember and smoke attack. The appropriate APZ is based on vegetation type, slope and levels of construction (and for SFPPs the nature of development). The APZ can include perimeter roads in new subdivisions. *Planning for Bushfire Protection 2006*.

16.5.7 Inspections and Monitoring

- Maintenance and ready access to all fire-fighting equipment is a critical element of bushfire risk management.
- During the bushfire season access to and the operation of all fire fighting equipment will be checked on a weekly basis. Outside the bushfire season equipment will be inspected and checked on a monthly basis. Records of weekly and monthly inspections shall be maintained.

16.6 Consultation

16.6.1 NSW Rural Fire Service (RFS)

In accordance with Condition B4 of the Project Approval, as the construction schedule for the Broken Hill Solar PV Power Station is refined and the construction effort progresses, First Solar will continue to consult with the NSW Rural Fire Service to ensure:

- Restrictions related to the prohibition and / or restriction of certain construction activities, at certain locations, in certain circumstances (e.g. periods of total fire bans) are clearly understood by all parties and adhered to
- The specification of fire suppression equipment available on site, include tanker access and sources of water, are adequate
- That a detailed and accurate site map is made available that specifies the location and quantities of all stored flammable material (e.g. fuels)
- That a suitable emergency evacuation plan is prepared and adequate training in the use of fire fighting equipment is provided.

First Solar acknowledges that the approval requires it to comply with any reasonable request of the local RFS. The appropriate local RFS contact is the Zone Manager, Far North Zone (contact details below):

Chris Favelle
Manager – Far West
Phone: (02) 6836 1226
E-mail: Chris.favelle@rfs.nsw.gov.au
Please call 000 for all emergencies
<http://www.farwest.rfs.nsw.gov.au/>

16.6.2 Broken Hill Fire Station

The Broken Hill Fire Station is located within the Broken Hill Township and is the likely first responder to bushfires within the area due to their proximity in comparison to the RFS. Therefore, in accordance with Condition B4 of the Project Approval, as the construction schedule for the Broken Hill Solar PV Power Station is refined and the construction effort progresses, First Solar will regularly consult with the Broken Hill Fire Station.

Broken Hill Fire Station will produce an Emergency Pre-Incident Plan for the site in the unlikely event that a bushfire related incident occurs. This will require a site visit to be undertaken preconstruction once a contractor has been appointed.

The appropriate contact details are provided below to organize the pre-construction site inspection:

Firefighter Gary Price
02 8087 4419.

16.6.3 Fire Fighting Service Access

A set of gate keys will be provided to the Broken Hill Fire Station to enable access to the Broken Hill Solar PV Power Station site as required. A final site plan, showing access points (and static water supply location – refer below) will be provided to the Broken Hill Fire Station and Rural Fire Service on completion of detailed design for the Broken Hill Solar PV Power Station and again post construction.

16.7 Emergency Evacuation

Emergency evacuation from the power station construction site will be undertaken in accordance with the First Solar Emergency Response Plan. All onsite personnel (including visitors) will be made aware of the emergency evacuation protocol.

First Solar will only utilise fire extinguishers for life safety evacuations or for putting out small fires where the operator has been trained in fire extinguisher use.

16.8 Objectives

This Community Consultation Plan for the Broken Hill Solar PV Power Station has been prepared to meet the requirements of:

- The Broken Hill Solar PV Power Station Project Approval (MP10-0202)
 - Condition C10
 - Condition C11
 - Condition C12.
- Broken Hill Solar Plant Submissions and Preferred Project Report (SKM, February 2013)
 - Commitment CC1
 - Commitment N1 and N4
 - Commitment S1.

16.9 Responsibilities

Project Manager

- Consultation with NSW Rural Fire Service prior to and during the construction phase.
- Notification to the AGL Project Manager in the event of a fire
- Sign-off on Event Notification and Investigation Report.
- Direction to the Construction Manager and Site Environmental Advisor on when to recommence work (as advised by the RFS).

Construction Manager

- Maintenance of fire-fighting equipment on site.
- Coordination of training in the use of fire-fighting equipment.
- Notification to the Project Manager of any fire incident.
- Input to the Event Notification and Investigation Report.

Site Health and Safety Manager / Site Environmental Advisor

- Notification to the Project Manager of any fire incident.
- Completion of Event Notification and Investigation Report.

Supervisors

- Notification to the Project Manager of any fire incident.
- Input to the Event Notification and Investigation Report.

Construction Personnel

- Notification to Supervisors of any fire incident.
- Input to the Event Notification and Investigation Report.

16.10 Records

- Event Notification and Investigation Report (P04).



17 Community Consultation

17.1 Scope

Responsibility for Community Consultation remains with the Proponent (AGL) during the Construction Phase. First Solar has adapted the following Consultation Plan from the AGL Community Consultation Plan Broken Hill and Nyngan Solar Plants. First Solar will work closely with AGL during the Construction Phase for the Broken Hill Solar PV Power Station to ensure compliance with the community consultation requirements set out in the Project Approval and the Broken Hill Solar Plant Submissions and Preferred Project Report.

17.2 Specific Consultation Conditions

Condition 3(c)(iv) Proposed landscape measures

Condition 3(c)(iv) requires *a consultation strategy to seek feedback from affected residents and the interested community on the proposed landscape measures.*

A consultation strategy on the proposed landscape measures will be developed as part of this Community Consultation Plan and in accordance with AGL (2013) *AGL Community Consultation Plan Broken Hill and Nyngan Solar Plants.*

17.3 Actions

17.3.1 Provision of Electronic Information

In order to facilitate AGL meeting its requirements under Condition C11 of the Project Approval, First Solar will provide AGL with the following information in order to meet this requirement:

- The status of the project
- Any additional licences or permits sought as part of the development of the Broken Hill Solar PV Power Station
- A copy of each plan required to be provided by First Solar under the Project Approval
- Information on the outcomes of compliance reviews and audits of the Broken Hill Solar PV Power Station development

The above information will be made available, at the discretion of AGL (in accordance with Condition C10 of the Project Approval), on the dedicated AGL Broken Hill Solar PV Power Station website.

17.3.2 Community Information Plan

In accordance with Condition C12 and Commitment CC1, AGL will implement a Community Information Plan. First Solar will provide AGL with the following information in order to meet this requirement:

- Information on planned investigations and construction activities
- Information on construction traffic expectations and scheduling
- Information on construction traffic routes and potential disruptions to traffic flows
- Information on construction traffic to ensure the safety of lives and minimise disruption to livestock movements
- Information (as required) to meet landowner notification requirements regarding work scheduling, including out of hours work
- Procedures to inform and consult with the Crown Lands Division of the Department of Trade and Investment to rehabilitate land.

17.3.3 Key Stakeholders

In accordance with the AGL Community Consultation Management Plan, First Solar will provide suitable representatives from the project team to meet with key stakeholders as required by AGL. Key stakeholders may include, but are not limited to, the following:

- Neighbouring landowners
- Broken Hill City Council
- Community groups, e.g. Chambers of Commerce, Service Groups
- Broken Hill lead (Pb) management groups.

Consultation with nearby residents (as required by Commitment S1) will be managed by AGL (as primary point of contact) in conjunction with First Solar (at the request of AGL).

17.3.4 Complaints Procedure

In accordance with Condition C13 of the Project Approval, AGL will provide the following:

- Project 24 hour telephone number
- Project postal address
- Project email address

This information will be publicly advertised by AGL in accordance with the requirements of the Project Approval. In addition this contact information is available within the Community Matters

section of the dedicated AGL Broken Hill Solar PV Power Station webpage (developed in accordance with Condition C11).

<http://www.agl.com.au/about-agl/how-we-source-energy/renewable-energy/broken-hill-solarplant/community-matters>

During the Construction Phase First Solar will work with AGL to address any concerns / complaints raised by the public via the above contact mechanisms.

Further information on the First Solar Complaints Management Protocol is available in CEMP-P.



18 Environmental Management Schedules

Environmental management schedules are copies of forms, reports or registers used during a project's day to day environmental management. This section lists the Plan Schedules that apply to the whole CEMP as well as the Sub-plan schedules required for each specific environmental issue.

18.1 Plan Schedules

A summary of the environmental schedules for this CEMP (Plan) that apply across all construction activities are listed in Table 12.

Table 12: CEMP Environmental Management Schedules

Schedule No.	Title	CEMP Attachment
Form D01	Noise Monitoring Record	Appendix F CEMP Environmental Management Schedules
Form GC01	Construction water record	
Form GC02	Rehabilitation and revegetation photo monitoring record	
Form GC03	Rehabilitation and revegetation photo monitoring record	
Form GC04	Daily meteorological record	
Form GC05	Waste management plan	
Form P01	Weekly Site Inspections	
Form P02	Complaints Record	
Form P03	Incidents Register	
Form P04	Event Notification and Investigation Report	
Form P05	Hazard Report Form	
Form P06	Environmental Awareness Induction Register	
Form P07	Environmental Compliance Training Register	
Form P08	CEMP Auditing and Review	
Form P09	CEMP	

Where:

- GC = General Condition
- P = Plan (CEMP Plan)

18.2 Sub-plan Environmental Management Schedules

A summary of the environmental schedules attached to the CEMP Sub-plans are listed in Table 13.

Table 13: List of Sub-plan Environmental Management Schedules

Schedule No.	Title	CEMP Sub-plan
Form A01	Perimeter fence monitoring record	A – Flora and Fauna Management Plan
Form A02	Fauna handling record	A – Flora and Fauna Management Plan
Form B01	Ground cover monitoring record	B – Ground Cover Management Plan
Form B02	Weed management activities and control	B – Ground Cover Management Plan
Form C01	Landscape monitoring record	C – Landscape Management Plan
Form C02	Photo viewpoint monitoring record	C – Landscape Management Plan
Form D01	Noise monitoring record	D – Construction Noise Management Plan

18.3 First Solar HSE 'Intelex' System

First Solar implements an integrated Health, Safety and Environmental Management System via a web based computer system called Intelex.

Intelex is a workflow management tool which provides the following functionality:

- A structured approach to scheduled audits and monitoring inspections, capturing non-compliance and incidents, with follow-up actions for resolution
- Ability to report and compare actual HSE performance within and across all First Solar projects and at all levels of the organisation
- Intuitive data entry and retrieval, which allows First Solar to improve reporting accuracy and identify HSE trends across the business.
- A robust process for capturing HSE incidents, including investigation findings, incident management and corrective action items
- A secure, centralised repository for HSE document control and records management
- A uniform and proactive approach to HSE risk management

All reporting requirements described in Section 20 will be captured within the First Solar Intelex system.

19 Agency Consultation for CEMP Development

First Solar has developed the CEMP in consultation with AGL (the Applicant) and the Project Environmental Representative (engaged in accordance with Condition C1).

In addition, consultation during the development of the CEMP was undertaken where government agencies with specific environmental protection responsibilities were identified and/or where consultation was required by the Project Approval.

The list of government agencies consulted during the development of this CEMP is provided in Table 14. Correspondence with and comments from agencies on the issue specific sub-plans is documented in Appendix G. This includes a summary of verbal consultation undertaken (on bushfire and waste management) and agency contact details.

Table 14: Stakeholders and Relevant CEMP Sections

Stakeholder	CEMP Section
Broken Hill City Council (BHCC)	Section 6.5 Construction Water Supply Section 15 Waste Management
Crown Lands Division of the Department of Trade and Investment	Sub-plan B – Ground Cover Management Plan
Essential Energy	Section 6.5 Construction water supply
NSW Office of Environment and Heritage (OEH)	Sub-plan A – Flora and Fauna Management Plan
NSW Office of Water (NOW)	Section 10 Soil and Water Management
NSW Roads and Maritime Services (RMS)	Sub-plan E – Construction Traffic Management Plan
NSW Rural Fire Service (RFS)	Section 16 Bushfire Management ¹

Table 15: Summary of Consultation undertaken with Government Stakeholders

Organisation	Consultation	Response	Contact Person	Contact Person Details Email and Location
Broken Hill Fire Station	Discussed planned bushfire management	Understood and agreed with general principles and management measures within the Sub-plan. Offered to store a set of keys to the site as they would be the first responder in an incident. Have offered to do a site inspection early in the construction phase to assist with the preparation of an incident checklist and a management plan.	Gary Price (Firefighter)	02 8087 4419
New South Wales Region Fire Service	Discussed planned bushfire management	Understood and agreed with the principles and management measures contained within Sub-plan. Agreed that Broken Hill Fire Station would be first responder.	Chris Favelle Manager – Far West Division	T: 02 6836 1226 Chris.favelle@rfs.nsw.gov.au
Broken Hill Waste Management	Discussed planned waste management strategy. Discussed capacity and services available of the Broken Hill City Council Landfill and Waste Depot.	Provided advice on the Broken Hill City Council Landfill and Waste Depot and it's services. Agreed with waste management principles contained within the Sub-plan. Provided input on potential facilities for contaminated waste (likely Adelaide).	Chris Manoel (Waste Services Supervisor)	M: 0458242190
Office of Environment and Heritage	Review of Flora and Fauna Management Plan	OEH has reviewed the Construction Environmental Management Plan (CEMP) - Sub-plan A- Flora and Fauna Management Plan and is satisfied that it meets the conditions of the Broken Hill Solar PV Power Station Project Approval (Application No.: MP10_0202). At this stage, OEH has no further comment to make in regards to this development.	Peter Ewin (Team Leader Planning, South West)	T: 02 6022 0606 M: 0427 433 937 Peter.Ewin@environment.nsw.gov.au

Organisation	Consultation	Response	Contact Person	Contact Person Details Email and Location
		At this stage OEH has not contacted the Department of Planning and Environment to confirm this outcome.		
Office of Water Department of Primary Industries	Review of Soil and Water Management Plan	Provided comments and requested clarification on sediment and erosion control measures.	Tim Baker (Senior Water Regulation Officer)	T: 02 6841 7403 M: 0428162097 Tim.Baker@water.nsw.gov.au
NSW Trade & Investment, Crown Lands	Review of Ground Cover Management Plan	The consultant engaged appears to have adequate experience in the required field and we do not require a copy of the Plan prior to submission to Planning.	Andrew Bell (Senior Area Manager Far West and Western Lands Commissioner)	T: 02 6883 5401 M: 0409 100 587 andrew.bell@crownland.nsw.gov.au

20 Environmental Performance

20.1 Objectives and Targets

The following section outlines the objectives and targets for the First Solar CEMP. The purpose of setting objectives and targets for the CEMP is to enable the construction works to meet a defined level of performance against identified criteria. The criteria outlined below will provide context to any review of the CEMP undertaken in accordance with CEMP Audit and Review procedures and compliance reporting.

First Solar will provide performance information as required to AGL for regular reporting of the project on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this approval.

The following objectives and targets have been set to be specific, measurable, realistic and achievable. The First Solar Environmental Manager is responsible for setting and managing the achievement of the environmental objectives and targets (in consultation with the Site Project Manager and the Site Construction Manager) outlined in Table 16.

Table 16: CEMP Objectives and Targets

Aspect	Objective	Target	Documentation
Environmental compliance	Construction to be undertaken in accordance with the Broken Hill Project Approval	<ul style="list-style-type: none"> 100% compliance with the Project Approval Conditions. Zero reportable environmental incidents. 	<ul style="list-style-type: none"> Weekly Site Inspections. CEMP Checklist. Audits and Review. Monthly Compliance Tracking reporting to AGL.
Legal compliance	Compliance with all environmental legal requirements	<ul style="list-style-type: none"> 100% compliance with all environmental legal requirements. Zero reportable environmental incidents. 	<ul style="list-style-type: none"> Compliance tracking through Intalex. Internal CEMP Audits and Review.
Best practice environmental management	Effective implementation of CEMP Sub-plans to ensure best practice environmental management	<ul style="list-style-type: none"> 100% compliance with measurable management and mitigation measures outlined in the CEMP Sub-plans. Zero reportable environmental incidents. 	<ul style="list-style-type: none"> Monthly Compliance Tracking reporting to AGL. Internal CEMP Audits and Review.
Environmental complaints	Minimise environmental complaints and adequately address any environmental complaints in a timely	<ul style="list-style-type: none"> Zero community complaints. 100% compliance with complaint response timeframes. 100% compliance with 	<ul style="list-style-type: none"> Monthly Compliance Tracking reporting to AGL. Internal CEMP Audits and Review.



Aspect	Objective	Target	Documentation
	manner	timeframes for complaint investigations and close-outs.	
Incidents	Minimise, avoid and appropriately manage all environmental incidents	<ul style="list-style-type: none"> • Zero reportable environmental incidents. • 100% compliance with incident reporting, investigation and implementation of corrective action timeframes. 	<ul style="list-style-type: none"> • Environmental Incident Register. • Environmental Incident Reports • Monthly Compliance Tracking reporting to AGL. • Internal CEMP Audits and Review.
Non conformance	Minimise, avoid and appropriately manage all environmental non conformances	<ul style="list-style-type: none"> • Zero reportable environmental non-conformances. • 100% compliance with timeframes for the investigation and implementation of corrective actions. 	<ul style="list-style-type: none"> • Weekly Inspections. • Monthly Compliance Tracking reporting to AGL. • Internal CEMP Audits and Review.
Audit and inspection	Undertake environmental site audits and inspections in a timely manner	<ul style="list-style-type: none"> • 100% compliance with timeframes for environmental audits and inspections. • 100% compliance with timeframes for implementation of identified corrective actions. 	<ul style="list-style-type: none"> • Weekly Site Inspections. • External Audits and Review. • Internal CEMP Audits and Review.
Environmental awareness and compliance training	All staff to be aware of their environmental obligations and to be competent in relation to their environmental responsibilities	<ul style="list-style-type: none"> • 100% compliance with WEAC Training Commitments. • Zero reportable environmental incidents. 	<ul style="list-style-type: none"> • Site induction register. • WEAC Training. • Internal CEMP Audits.



20.2 Inspections and Monitoring

20.2.1 Weekly site inspections

Weekly site inspections will be undertaken by the Site Environmental Advisor using Form P01 (provided in Appendix F).

The Site Environmental Advisor shall undertake the weekly site inspection on random days (and depending on the weather). The site inspection shall cover the following work areas:

- Barrier Highway intersection
- Site access road
- Site construction compound area
- Construction laydown areas
- Switchyard area
- PV arrays
- Areas external to the site works but within the property boundary.

The weekly site inspection shall include erosion and sediment control measures as required by the Soil and Water Management Plan (refer Section 10).

Inspection shall be made immediately prior and following rainfall exceeding 15 mm in 24 hours and be recorded on Form P01 (see Appendix F). It is expected that falls of 15 mm will be sufficient to cause site runoff, although smaller rainfall events in wet conditions may also generate runoff in certain circumstances. Site inspections should be initiated if site runoff is observed.

The Site Environmental Advisor shall advise the Construction Manager of any required actions and follow up on their completion. The Site Environmental Advisor shall forward copies of Form-P01 (attached) to the First Solar Project Manager at the end of each month.

20.2.2 Environmental Representative (ER) Inspections

The Environmental Representative will conduct regular site visits. These inspections will be frequent at the commencement of site activities and intermittent towards completion, but on average equate to approximately one site visit per month.

The Environmental Representative will prepare an inspection report following each visit for presentation to AGL and First Solar. Where required, corrective actions will be discussed and agreed with First Solar and included on inspection reports.

The Environmental Representative will also periodically review the Compliance Tracking Program (refer Section 20.6).



20.2.3 Environmental monitoring

The environmental management activities, controls and mitigations outlined in this CEMP shall be monitored and recorded in accordance with the environmental schedules related to each Sub-plan (see Section 18).

All monitoring records shall be held on site in the Site Office for the duration of the construction of the power station. Where practicable, the use of hard copies will be minimised and storage of electronic copies in Intalex.

20.3 Audit and Review

20.3.1 Purpose

As recommended by Section 3.5 of the *Guideline for the Preparation of Environmental Management Plans* and in accordance with Condition C16(b), First Solar has developed a CEMP Auditing and Review Procedure. The purpose of this procedure is regular review and audit of the First Solar CEMP to ensure:

- Effective implementation of the CEMP
- Relevance of the environmental controls and procedures contained within the CEMP to the Construction Phase of the Broken Hill Solar PV Power Station
- Identification of opportunities to improve the controls and procedures contained within the CEMP.

20.3.2 CEMP audits

First Solar shall undertake internal CEMP audits:

- After three months from the commencement of construction
- Every 6 months thereafter until the conclusion of the Construction Phase.

First Solar will also commission independent environmental auditing to meet the requirements of the Compliance Tracking Program (see Section 20.6). The findings of both internal and independent audit shall be distributed to:

- First Solar National HSE Manager
- First Solar Project Manager
- First Solar Construction Manager
- First Solar Site Environmental Advisor
- AGL's Project Manager
- AGL's Environmental Representative (engaged in accordance with Condition C1)
- Relevant stakeholders (if applicable).



The internal and independent audits are in addition to those to be undertaken by the Environmental Representative as outlined in Section 8.2.2.

The audit shall serve, but not be limited to, the following purposes:

- Determining whether or not the First Solar CEMP has been implemented and maintained
- Checking that environmental schedules being completed and signed off by the Site Environmental Advisor
- Checking that the routine site records are being maintained and filed by the Site Environmental Advisor
- Checking that CEMP Review's are being undertaken by the Site Environmental Advisor, and in accordance with this plan
- Reviewing incident management processes to ensure that reporting requirements, incident investigations and incident close outs are occurring in accordance with the procedure
- Reviewing compliance against the documentation identified in Condition A2 (as it relates to the construction phase and the activities of First Solar)
- Reviewing implementation of the CEMP with the First Solar Construction Manager and First Solar Environmental Advisor to confirm all elements of the CEMP remain applicable
- Check that there are no outstanding follow-up actions that have yet to be closed off.

CEMP audits will be recorded on Form P07 (see Appendix F Environmental Management Schedules). Results of the CEMP audit shall be provided to the persons participating in the audit and AGL.

Results of the CEMP audit shall also be provided to the Site Environmental Advisor for site based implementation (where applicable).

20.3.3 CEMP review

The Site Environmental Advisor shall undertake a review of the First Solar Broken Hill CEMP in response to:

- Each CEMP audit
- As required, throughout the Construction Phase where there is a change to the construction schedule, the site layout or a change in the construction methodology
- As required, throughout the Construction Phase where site based conditions require a change to the environmental controls and procedures identified within the CEMP
- As required, throughout the Construction Phase in response to an environmental incident
- As required, throughout the Construction Phase when directed to by the First Solar National HSE Manager or the First Solar Environmental Manager.

The CEMP review shall consider the environmental controls and procedures set out within the First Solar CEMP (inclusive of the appendices) to make sure the environmental controls and procedures remain applicable to the activities being carried out.



Any recommendations from the review will be issued to the National HSE Manager and First Solar Environmental Manager for communication to relevant stakeholders.

A change Management process will be put in place (if required) to ensure the effective communication of changes to the CEMP to relevant stakeholders, including onsite personnel and management. If required, additional onsite Worker Environmental Awareness and Compliance Training (WEAC) will be conducted for existing onsite personnel. Where a change is made to the WEAC program, it will be updated to ensure the information is up to date.

Any changes to the CEMP or the CEMP appendices will be version controlled within each document (as applicable). Updated versions of the CEMP (including relevant appendices) will be circulated to all CEMP holders via the approved document management system and communicated at tool box meetings. CEMP reviews will be recorded on Form P07 (see Appendix F Environmental Management Schedules).

The role of the Environmental Representative Note includes approving minor updates of the CEMP (Condition C1e).

A minor change to the First Solar CEMP is defined as a change that does not materially:

1. Compromise First Solar's ability or intent to comply with the documents identified in Project Approval Condition A2
2. Increase the likelihood of material environmental harm occurring.

20.4 Corrective Actions

Non-compliance may be identified through the routine CEMP Audit and Review process or be incident based.

The hierarchy of environmental non-compliance (from least to most serious) is generally as follows:

1. Non-compliance with environmental management controls or mitigation
2. Environmental incidents
3. Potential environmental emergencies (as defined in Section 8.5)
4. Actual environmental emergencies (as defined in Section 8.5).

Corrective actions may be triggered by any of the above.

Where a need for correction actions is identified, the Site Environmental Advisor shall, in consultation with relevant onsite or external stakeholders, identify and implement corrective actions.

Where correction actions are developed, First Solar will utilise the Intelex system outlined in Section 18.3 to record, track and close-out corrective actions.

Incidents shall be recorded and reported in accordance with the Incident Management Protocol described in the following section.



20.5 Incident Management

The section describes the procedure for incident reporting, management and incorporation of corrective actions in this CEMP.

20.5.1 Notification reporting requirements

The Project Approval Conditions require incident based notification, during the construction phase, to agencies as listed in Table 17.

Condition C8 requires that any incident that has caused, or threatens to cause, material harm to the environment should be reported to the Director General and any relevant agencies. Relevant agencies include the Environment Protection Authority (EPA) Duty to Notify under the *Protection of the Environment Operations Act 1997* (POEO Act), the Office of Environment and Heritage (OEH) and the NSW Office of Water (NOW).

Table 17: Agency Reporting Requirements

Condition	Trigger	Agency	Timeframe
B32	Proponent becomes aware of any previously unidentified Aboriginal object(s).	OEH Registered Aboriginal stakeholders	Earliest opportunity
B33	Proponent becomes aware of any unexpected historical relic(s)	Heritage Office	Earliest opportunity
C8	Any incident that has caused, or threatens to cause, material harm to the environment.	Director General (DoPI) and any relevant agency	Earliest opportunity Report to be provided to Director General within 7 days of the incident

20.5.2 Environmental incidents process

The environmental incidents management process is described in the flow chart shown in Figure 8. Implementation of this process requires an understanding of the definition of material environmental harm. This definition is provided below:

Material harm to the environment is defined in Section 147 of the New South Wales *Protection of the Environment Operations Act 1997* as:

(a) *harm to the environment is material if:*

- i) *it involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or*
- ii) *it results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000 (or such other amount as is prescribed by the regulations), and*



(b) loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment.”

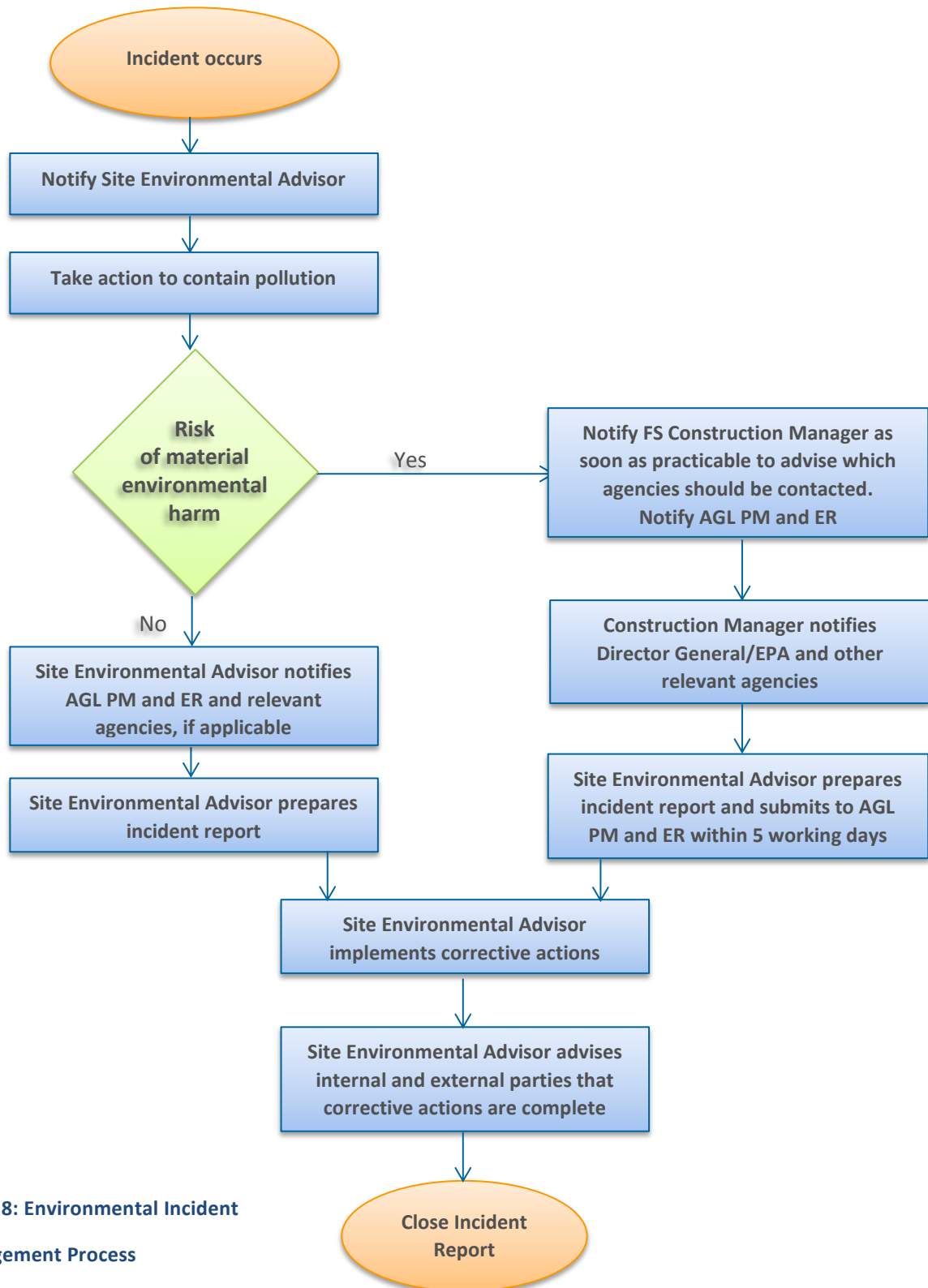


Figure 8: Environmental Incident Management Process



20.5.3 Emergency environmental incident

A First Solar Site Environmental Advisor will:

- Be based at the Broken Hill Solar PV Power Station site during the Construction Phase in the event of an environmental emergency that causes or has the potential to cause material harm to the environment
- Determine whether the event is an incident, subject to this procedure, or a hazard (to be recorded on Form P04)
- Notify the Environmental Representative (ER) as soon as practicable and include ER on the distribution list for incident reports
- Have the authority to stop or direct work in the event of an environmental emergency
- Be contactable on site via UHF or mobile phone. Additionally, the Site Environmental Advisor will have access to a site vehicle and spill response equipment to allow a rapid response to environmental incidents.

The responsibilities of the Site Environmental Advisor, with respect to environmental incidents, are included within the *Worker Environmental Awareness and Compliance Training* (WEAC).

The onsite contact details for the Site Environmental Advisor will be made available onsite to relevant parties, including Site Supervisors.

20.5.4 Incident report

The Site Environmental Advisor will:

- Assign a sequential number to each incident and record on the Incident Register (Form P03, Appendix F Environmental Management Schedules)
- Prepare an Incident Report. Additional pages/reports will be attached to the Incident Report as required
- Record the information in to the First Solar Compliance Tracking System (Intelex) identified in the CEMP overarching document.

20.5.5 Records

- Incidents Register (Form P03).
- Event Notification and Investigation Report (Form P04).



20.6 Compliance Tracking Program

Condition C16 of the Development Consent requires the development and implementation of a Compliance Tracking Program. The objective of this program is to demonstrate the construction of the Broken Hill Solar PV Power Station complies with the Development Approval Conditions. The tracking program is described in Table 18. The primary compliance tracking mechanism will be monthly reports submitted to AGL.

Table 18: Compliance Tracking Program

Tracking Requirement	First Solar Commitment
Monthly reporting of compliance status to the Director General	<ul style="list-style-type: none"> • In accordance with its agreement with AGL, First Solar will provide monthly construction phase environmental compliance reporting to AGL. • AGL will retain responsibility for periodic reporting to the Director General. • Periodic reporting against the objectives and targets described in Section 20.1. • Implementation of the CEMP Environmental Monitoring Procedure described in Section 20.2.
Independent environmental auditing in accordance with AS/NZ ISO 19011:2011	<ul style="list-style-type: none"> • First Solar to commission independent environmental auditing. • Implementation of the CEMP Audit and Review procedure described in Section 20.3.2 (internal audits).
Procedures for rectifying any non-compliance identified	<ul style="list-style-type: none"> • Implementation of corrective actions as directed by the Project Environmental Representative or the First Solar Site Environmental Advisor. • Implementation of the CEMP Corrective Actions procedure described in Section 20.4. • Update of the CEMP and/or Sub-plans as to prevent future non-compliances.
Mechanisms for recording environmental incidents and responses	<ul style="list-style-type: none"> • Implementation of the CEMP Incident Management Protocol described in Section 20.5.
Provisions for reporting environmental incidents to the Director-General	<ul style="list-style-type: none"> • Implementation of the CEMP Incident Management Protocol described in Section 20.5.
Provisions for ensuring all employees comply with Project Approval environmental conditions	<ul style="list-style-type: none"> • Implementation of CEMP Environmental Training Requirements described in Section 8.4.



21 Complaints Handling Procedure

21.1 Purpose

The purpose of this procedure is to ensure rapid response to community complaints during the construction phase by providing accessible systems to the public throughout the duration of the project. Any complaints received during construction will be managed by AGL. However, First Solar will provide the information required to ensure compliance with the Project Approval conditions.

21.2 Methods to Receive Complaints

The following systems will be put in place for the community to use for lodging complaints:

- A 24 hour telephone number for registration of complaints about construction activities
- A postal address for lodgement of a written complaint
- An email address for electronic lodgement of a written complaint.

Project Approval Condition C13 specifies methods and timeframes (construction and operational phases) for advertising contact details. These requirements will be managed by the Proponent (AGL). First Solar will work with AGL to ensure complaints are investigated and managed through the construction phase.

The community will be made aware of these communication methods in the *Community Consultation Plan* (CEMP Sub-plan N) and the AGL's *Community Consultation Plan Broken Hill and Nyngan Solar Plants*.

In addition, contact details will be provided within the 'Community Matters' section of the dedicated AGL Broken Hill Solar PV Power Station website (<http://www.agl.com.au/about-agl/how-we-source-energy/renewable-energy/broken-hill-solar-plant/community-matters>).

21.3 Complaints Management Process

First Solar may receive complaints directly (e.g. verbally or written) or via the Proponent. All information will be recorded in the complaints register (Form P02, Appendix F Environmental Management Schedules). This register will be available for inspection by the Director-General upon request.



The process for managing and responding to complaints is to:

- Refer the complaint to the Site Environmental Advisor to assign a sequential number to the complaint and record it in the complaints register
- Site Environmental Advisor to notify AGL Project Manager as soon as practicable (unless complaint was received via AGL), in order to provide an initial response within 48 hours of receipt of the complaint
- Site Environmental Advisor to ensure that any subsequent actions are closed off within two weeks of the receipt of the complaint

Site Environmental Advisor to record the details and information on the Complaint Record (Form P02, Appendix F Environmental Management Schedules):

- Date and time of the complaint
 - Method of complaint (direct, telephone, mail or email)
 - Personal details if provided, else a note to that effect
 - The nature of the complaint
 - Any actions taken or to be undertaken and timeframes
 - Reasons for no action being undertaken
 - Follow up and close off date for the complaint.
- Investigation of the complaint will be assigned to a relevant person for investigation in accordance with the Site Environmental Advisor
 - All complaints are to be addressed as soon as possible or within 48 hours of receiving the complaint
 - Issues are to be escalated to the AGL Project Manager if they cannot be managed by the Site Environmental Advisor
 - The complainant shall be notified of the outcome by the Proponent (AGL)
 - The Site Environmental Advisor will sign off on the Complaint Record when response/actions completed
 - The Complaint Record shall be filed by the Site Environmental Advisor.

The Environmental Representative shall be informed of all complaints on the same day or at least within 24 hours of receiving a complaint.



21.4 Verbal Complaints Received by Construction Personnel

The following actions shall be undertaken in the event that a verbal complaint is received directly by any construction personnel:

1. The person receiving the complaint shall:
 - a. Acknowledge and advise that it will be referred to the relevant person
 - b. Collect contact details
 - c. Advise on the formal mechanisms for lodging a complaint and the contact details
 - d. Encourage the complainant to lodge this and future complaints via the available methods.
2. The person receiving the complaint shall advise their supervisor as soon as possible
3. The supervisor shall notify the Site Environmental Advisor and Project Manager of the receipt of a complaint as soon as possible to ensure compliance with reporting timeframes
4. If a valid complaint about dust generation is received directly by construction personnel, the construction personnel shall cease the activity immediately and notify the Site Environmental Advisor
5. The Site Environmental Advisor shall follow up on the complaint and responses in accordance with the complaints management process.



22 References

- AGL Energy Limited (2013). *AGL Community Consultation Plan Broken Hill and Nyngan Solar Plants*.
- AS 1940 – 2004. *The Storage and Handling of Flammable and Combustible Liquids*.
- AS 3780 – 2008. *The Storage and Handling of Corrosive Substances*.
- AS/NZ 4452 – 1997. *The Storage and Handling of Toxic Substances*.
- DEC (2005). *Environmental Compliance Report: Liquid Chemical Storage, Handling and Spill Management; Part B, Review of Best Proactive and Regulation, 2005*.
- DECC (2007). *Storage and Handling Liquids: Environmental Protection Participants Manual, 2007*.
- DECC (2009). *Interim Construction Noise Guideline. Department of Environment and Climate Change*.
- DIPNR (2004). *Guideline for the Preparation of Environmental Management Plans*. Department of Infrastructure, Planning and Natural Resources.
- DPI. *Policy and guidelines: fish-friendly waterway crossings*, available at: www.dpi.nsw.gov.au/fisheries/habitat/publications/policies,-guidelines-and-manuals.
- Fairfull, S. and Witheridge, G. (2003). *Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings*. NSW Fisheries, Cronulla, 16 pp.
- Heritage Act 1977*.
- ISO 19011:2011. *Guidelines for auditing management systems*.
- Landcom (2004). *Managing Urban Stormwater – Soils and Construction Vol.1* (4th edition).
- National Parks and Wildlife Act 1974*.
- ng environmental (2013a). *Broken Hill Solar Plant Raptor Management Plan*. June 2013.
- ng environmental (2013b). *Biodiversity Offset Management Plan, Broken Hill Solar Plant*. July 2013.
- NOW (2012). *Guidelines for Controlled Activities on Waterfront Land* (NOW, July 2012).
- OzArk Environmental and Heritage Management (2013). *Documentation of actions in relation to the Aboriginal Cultural Heritage Management Plan for AGL Energy Limited (AGL), Broken Hill Solar Plant* (December, 2013).
- Project Approval (Application No. MP10_2020).
- SKM (2012). *Broken Hill Solar Plant Environmental Assessment*. October 2012.
- SKM (2013). *Broken Hill Solar Plant Submissions and Preferred Project Report*. Sinclair Knight Merz. February 2013.



CEMP Attachments



Sub-plan A – Flora and Fauna Management Plan



CEMP- Sub-plan A – Flora and Fauna Management Plan

1. Objectives

The primary objectives of this *Construction Flora and Fauna Management Plan* for the Broken Hill Solar PV Power Station and access roads and tracks are to:

- Outline the measures to protect and minimise loss of native vegetation and native fauna habitat as a result of construction of the project
- Minimise the incidence of wildlife mortality associated with construction activities and site traffic
- Maintain a buffer zone around the raptor nest to the west of the site.

This plan has been prepared to meet the requirements of:

- Broken Hill Solar PV Power Station Project Approval (Application No: MP10_0202)
 - Condition C3(a)
 - Condition B15
 - Condition B16
 - Condition B18
 - Condition B19
- *Broken Hill Solar Plant Submissions and Preferred Project Report* (SKM, February 2013) FF1 to FF10.

This management plan is based on information provided in SKM (2012) *AGL Broken Hill Solar Plant, Environmental Assessment* (October 2012).

As this CEMP does not relate to the overhead transmission line connection to the electricity grid, condition B17 is not addressed within this document.

2. Relationship to other Plans and CEMP Sub-plans

2.1 Biodiversity Offset Management Package

Condition C5 of the Project Approval requires the development of a Biodiversity Offset Management Plan. In accordance with Condition C5, the package details how ecological values lost as a result of the development will be offset. The management plan is required to be developed prior to the commencement of construction (or as otherwise agreed to by the Director-General).

The Biodiversity Offset Management Plan was prepared by a third party on behalf of the proponent (AGL). The Biodiversity Offset Management Plan does not form part of this *Flora and Fauna Management Plan*.

For further information relating to the offset site please refer to the AGL Biodiversity Offset Management Plan for the Broken Hill Solar Plant (ngh environmental July2013b).

2.2 Raptor Management Plan

The Raptor Management Plan (ngh environmental June 2013a) was developed in response to approval conditions B18 and B19 and commitment FF3. The authors of the plan consider that the raptor nest to the west of the site is more likely to be a Wedge-tailed Eagle nest than that of the state-listed Black-breasted Buzzard.

The plan specifies buffer zones around the nest, and a protocol for monitoring nest occupation. Approval was gained to reduce the size of the buffer from 500 metres (listed in the development approval conditions) to a radius of 350 metres if the nest is unused, or 400 metres if the nest is used by a Wedge-tailed Eagle or any other raptor species.

2.3 Other Components of the Construction Environmental Management Plan

The approval conditions also specify requirements for:

- C3(a) A Ground Cover Management Plan (CEMP Sub-plan B), to outline measures to ensure adequate vegetation cover and composition beneath the solar PV array
- C3(c) A Landscape Plan (CEMP Sub-plan C), to minimise visual impacts from the PV power station.

3. Flora and Fauna Plans

Figure-A01 identifies the indicative total area of vegetation community that may be slashed, or cleared as part of cut and fill activities, from within the construction footprint. A plan showing the terrestrial vegetation communities was included in the Environmental Assessment Report (SKM, 2012 Volume 2 Figure 7-1). Based on this report and figure, the potential clearance area includes the following:

- Map Unit 1: Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zone
- Map Unit 2: Prickly Wattle open shrubland of drainage line on stony rises and plains of the arid climate zone
- Map Unit 3: Narrow-leaved Hopbush-Scrub Turpentine – Senna shrubland of semi-arid and arid sandplains and dunes
- Map Unit 4: Mulga Dead Finish on stony hills mainly of the Channel Country and Broken Hill Complex Bioregions
- Map Unit 5: Disturbed Chenopod Low Open Shrubland
- Map Unit 6: Cleared Residential.

Figure-A02 identifies the location of the raptor nest to the west of the site. No Endangered Ecological Community's (EEC) exist on, or adjacent to, the site. With the exception of the raptor nest, no important habitat areas and/or threatened species, populations or ecological communities are likely to be present in areas immediately adjoining the site.

4. Management Measures

This section identifies methods to be adopted prior to, during and post construction to manage impacts on flora and fauna species and their habitat which may be directly or indirectly affected by the development.

4.1 General Management Methods

4.1.1 Site induction and flora and fauna information guides

The management methods outlined in this plan should be communicated to construction personnel during the site induction. While no threatened flora or fauna species have been recorded on the site or are considered likely to occur, identification guides should be prepared for the following species:

- Black-breasted Buzzard *Hamirostra melanosternon* and Wedge-tailed Eagle *Aquila audax*
- Bolams Mouse *Pseudomys bolami*
- Koonamore Daisy *Erodiophyllum elderi*
- Creeping Darling Pea *Swainsona viridis*.

4.1.2 Pre-disturbance surveys

The full extent of vegetation impact for all project components is estimated to be 140.4 ha. Slashing or clearance is required for the:

- Solar plant (the approach at this location is to retain as much vegetation as possible, refer Section 4.1.4)
- Construction staging area
- Laydown areas
- Overhead transmission line
- Underground transmission line
- Property boundary fence.

A pre-disturbance survey will be undertaken by an ecologist. The purpose of the survey will be to:

- Confirm the vegetation assessment undertaken by SKM (2012) and to ensure that the correct suite of significant species has been considered
- Assess the site with regard to recent climatic conditions and report any relevant issues to the Project Manager
- Undertake a search of potential habitat areas within the slashing/clearing zone for Koonamore Daisy and Creeping Darling Pea
- Monitor the raptor nest to the west of the site to check for occupancy

- Assist the project manager to delineate and mark the impact boundary and record the extent of any vegetation community to be cleared (e.g. for cut and fill), as required by commitment FF1 and approval condition C3(a)(iii)
- Identify degraded areas outside the construction footprint suitable for revegetation and re-distribution of coarse woody debris (refer to section 6.1.5), as required by commitment FF5
- Identify suitable sites within the property to receive translocated fauna species during the construction phase.

4.1.3 Ecological supervision during construction

- An ecologist will be present during all slashing/clearing activities to minimise impacts on threatened fauna. The ecologist will be responsible for carrying out fauna handling procedures outlined in section 6.2.
- The ecologist will also keep photographic and spatial (map) records of the extent of vegetation slashing/clearance as required by commitment FF1 and approval condition C3(a).
- Cleared areas should be mapped using a handheld GPS by an ecologist walking the boundary of the clearing. Mapped polygons should then be combined in a GIS to document the actual extent of clearing of the type and condition units identified in the ecological assessment. This quantification of actual clearing is required to determine offset targets (refer to the Offset Management Plan – ngh environmental 2013b).

4.1.4 Vegetation clearance

During the site enabling works, First Solar will prepare the solar PV array areas and laydown areas for the installation of the power station infrastructure (e.g. posts, tilts, tables and PV modules). This process will include the following:

- Surveying of the site in accordance with the final site layout design
- Removal of ground cover vegetation within the construction lay down areas using construction machinery
- If required to meet soil compaction requirements the lay down areas will be rolled with a non-vibrating drum roller
- In the array areas:
 - Retaining as much existing ground cover as possible
 - Undertaking slashing to reduce ground cover to a manageable height if practicable (the alternative will be to use a scraper to blade off shrubland above the ground surface)
 - Minimising the area of topsoil stripping

- Undertaking cut and fill on localised high points only as per the cut and fill civil drawing (refer soil and water management plan).

If topsoil has been stripped, First Solar will implement measures to minimise the impact as far as practicable to facilitate rehabilitation and re-vegetation of ground cover within the array areas. The following measures will be implemented:

- Topsoil will not be removed from the array areas during construction works
- Topsoil will be spread over the ground surface following localised areas of cut and fill across the site
- If temporary stockpiling of soil is necessary, this will be no longer than two weeks.

The boundary of the solar array area will be marked, as specified in section 4.1.2. This area is shown in Figure A01. The areas and amount of cut and fill to be undertaken for preparation of the solar array area is shown in Figure A03.

4.1.5 Use and disposal of cleared vegetation

- Non-weedy vegetation will be mulched and re-used for site stabilisation and rehabilitation. Introduced vegetation will not be re-used as mulch on any part of the site.
- Slashed/cleared native plant material will be shredded when it is first cut, and allowed to decompose while the works are carried out. The decomposing pile will be stockpiled in a weed free area.
- Slashed/cleared vegetation that is not needed for mulch should be removed from the site to the appropriate Broken Hill landfill facility.
- Where practicable, woody vegetation with a stem diameter of 10cm or greater may be placed within areas of retained vegetation to provide additional ground based fauna habitat.

4.1.6 Hollow Bearing Trees

- The solar plant site does not support any known hollow bearing trees.

4.1.7 Coarse Woody Debris

- In accordance with approval condition B16, Coarse Woody Debris (CWD), including tree trunks/ logs, will be taken from construction areas and relocated into areas within the site outside the construction footprint.
- CWD would be scattered evenly across these areas, rather than being piled or windrowed.

4.1.8 Restoration and revegetation

- Shrubs removed from clearance areas should be mulched and spread lightly across disturbed areas within and outside the construction footprint to assist with soil stabilisation and water retention.

- Revegetation of these disturbed sites must be conducted using locally indigenous species, as specified in commitment FF8, the Ground Cover Management Plan and the Landscape Plan.

4.1.9 Raptor Nest

Refer to the Broken Hill Solar Plant Raptor Management Plan (ngh environmental 2013) for detail regarding management of the raptor nest to the west of the project site. A summary is provided below:

- The raptor nest observed by SKM (2012) is located in a small dead tree approximately 380 metres west of the solar plant boundary. ngh enviromental (2013a) consider the nest most likely to be a Wedge-tailed Eagle nest, rather than that of a Black Breasted Buzzard as suggested by SKM
- A permanent 350 metre radius no-go zone is to be established around the nest tree. No activity or access is permitted in this area during construction. The area may only be entered for the purpose of inspecting nest occupation by an ecologist on foot
- Occupation at the nest is to be monitored daily during construction, using binoculars or a spotting scope
- If any raptors are identified breeding at the nest site, the no-go buffer radius will be extended to 400m, and the species of raptor must be identified by an appropriately qualified expert (the fauna handler or project ecologist. If the species is identified as a Black-breasted Buzzard, OEH should be contacted immediately. For all other species, daily checks are to continue and the 400m buffer remains in place while the nest is occupied.

4.1.10 Trenching

- Trenches for electrical cables are 100-110 cm deep and up to 60 cm wide. Open trenches have the potential to capture terrestrial fauna, including small mammals and reptiles.
- Trenches will be left open for the least time practical and will be inspected for trapped fauna prior to the laying of cables and prior to back filling.
- Trenches left open overnight will be sloped at the end to allow any trapped fauna to escape. Additionally, 30° ramps will be located at regular intervals along the length of the trench. Typically ramps are located every 5m along the length of the trench. Ramps will provide a safe trench entry and exit point for both personnel and fauna.
- Open trenches opened up early in the day will be checked for trapped fauna at the end of the day. Any trench sections left open overnight will be inspected early in the morning and any trapped fauna removed.

- Where open trenches orientate such that there is full sunlight in the trench during the hottest time of the day, shade structures will be placed at intervals to provide areas of respite for fauna that may become trapped during the day.

4.1.11 Traffic management

- Traffic management measures will be incorporated in to the Construction Phase of the project. Traffic will be managed in accordance with the Vehicle Movement Management Plan which forms part of the First Solar Broken Hill Project Site Safety Plan.

4.1.12 Perimeter fence

- As detailed in Section 4.2.4 of the Broken Hill Solar Plant Environmental Assessment, the site boundary will be protected by a perimeter security fence. The proposed perimeter fence will be 2,370 to 2,970 mm in height and have three strands of barbed wire at the top. The fence would also include galvanised pipe top and bottom rails, and chain mesh.
- The fence will be constructed sequentially across the site to avoid entrapment of larger fauna species (e.g. kangaroos) within the perimeter fence.
- During construction of the fence, any open post holes will be checked daily and immediately prior to installation of fence posts. Any trapped animals will be released. Holes should also be checked during and following heavy rain, and the number of open holes should be minimised if rain is forecast.
- The project site is located in an open, largely treeless landscape, and the perimeter fence is not considered to pose a significant collision or entanglement risk to fauna. The fence construction method proposed will create a fence of sufficient visibility to be avoided by birds, bats and macropods.
- As a precaution, First Solar will undertake weekly inspections around the perimeter security fence to determine if any fauna have been killed as a result of collision or entanglement. If no bird strikes have been noted after four weeks, monitoring can be reduced to monthly.

4.1.13 Weed Management

- Introduced plant species within the solar farm site and along associated solar farm access tracks will be controlled in accordance with the *Ground Cover Management Plan* (CEMP Sub-plan B).

4.1.14 Waste Management

- All waste materials, including food, animal carcasses and other general waste will be removed from the site and disposed of appropriately. Any organic materials temporarily stored on site will be held in containers which do not allow access by wildlife or introduced pest animals.

4.1.15 Worker Environmental Awareness and Compliance Training

- Drivers accessing the site will be provided with induction training on the need to restrict vehicle movements to formed access tracks and to limit speeds to minimise the potential for fauna collision.
- All traffic on the site will be limited to 15 km/hr. Speed control signs will be posted on site.

4.2 Handling of Fauna

The handling and relocation of all native fauna will be undertaken by an ecologist/fauna handler who is suitably qualified and licensed, and in accordance with the procedures detailed below.

4.2.1 Native fauna Handling and Rescue Protocol

Measures will be implemented to prevent fauna entering active construction areas, however there remains a possibility that some fauna will still manage to enter active construction areas. Fauna may be identified in the construction area by the construction team, by the ecologist/fauna handler or by the onsite Environmental Advisor during daily trench searches or other onsite duties.

4.2.2 Pre-disturbance Surveys

- The ecologist/fauna handler will search fauna habitats during pre-disturbance surveys. All fauna habitat identified that will be impacted by construction activities, will be searched for resident fauna prior to work commencing. If individuals are found they will be relocated to adjacent habitat along with their habitat i.e. logs, if possible, outside of impact areas and in locations where they cannot readily / quickly re-enter active construction areas. Any burrowing fauna will be relocated and their burrows filled in to prevent them returning to the construction area.
- Relocation of species will be restricted to native faunal species. Where pest species are identified they will be humanely euthanised by an appropriately qualified person (the fauna handler or a Veterinarian).

4.2.3 General Capture and Release Methods

- The ecologist/fauna handler will be present at all times during the clearance of native vegetation and/or fauna habitats. Animals that require handling will not be approached or handled until the ecologist/fauna handler is present, unless in an emergency (e.g. when ecologist/fauna handler is not on-site and where the failure to immediately intervene would place the animal at significant risk). In such an emergency, the Site Environmental Advisor may obtain over the phone instructions from the ecologist/fauna handler to ameliorate the situation.
- All native animals encountered would be treated humanely, ethically and in accordance with relevant codes under the NSW *Prevention of Cruelty to Animals Act 1979*.

- If an animal is considered at risk of injury or undue stress by the ecologist/fauna handler, it will be encouraged to vacate the area via knocking, banging or gently shaking the area where the animal is sheltering, and the animal directed into secure adjoining habitat. Where deemed necessary by the ecologist/fauna handler, the animal may be required to be captured and released. Capture and release operations will proceed via the following protocols:
 - All construction activities that are considered by the ecologist/fauna handler to be likely to increase the risk of injury, mortality or stress to the animal will be halted until the animal has been removed. Construction activities that do not contribute to the risk of injury, mortality or stress to the animal can continue (as determined by the ecologist/fauna handler).
 - Only the ecologist/fauna handler (possessing appropriate licences and permits) are authorised to handle animals.
 - Animals will be captured by the ecologist/fauna handler using a safe and ethical technique, as is appropriate for the particular species. Animals that are unable to depart of their own accord will be captured and held in a receptacle appropriate for that species until release. Each receptacle will only hold one animal at a time and will be cleaned and disinfected between uses to avoid the spread of disease.

4.2.4 Appropriate containers for temporarily holding fauna

Animals that are unable to depart from a trench/pit or other parts of the construction area of their own accord will be captured and held in an appropriate receptacle until their release. Appropriate containers for temporarily holding various types of animals are:

- Small calico bag (~20cm x 30cm with cord to secure the opening, turned inside out so that seams are on the outside of the bag): small lizards, dragons, micro-chiropteran bats. Bag then slung from beam in a holding box until the time of release
- Large calico bag or pillowslip (~ 60 cm x 90 cm with cord to secure the opening, turned inside out so that seams are on the outside of the bag): snakes and large lizards. Bag then stored in a cardboard box with padding if required for transport
- Cage trap: ground-dwelling mammals, including feral animals. Trap to be covered with bag to reduce stress
- Elliot trap: small mammals and reptiles (e.g. larger lizards)
- Small box/open container with appropriate material for nestlings.

4.2.5 Management of captured native animals - uninjured

The following methods will be followed for the release of uninjured native fauna:

- Uninjured captured individuals will be immediately released at the nearest suitable habitat outside the construction area
- 'Suitable locations' will include habitats that are considered appropriate for the species, as determined by the ecologist/wildlife carer (e.g. sufficient protective cover, habitat features likely to support adequate food and water). The requirements of the species type will be taken in to consideration during relocation (e.g. territorial boundaries)
- If the ecologist/fauna handler is not trained to handle snakes (or a particular snake species), then either another Specialist who is trained and experienced at handling snakes will be brought to the site, or a licensed snake handler will be engaged
- For particular species (e.g., nocturnal species), the ecologist/fauna handler may also determine that it is beneficial to hold the animal/s safely in an appropriate receptacle until after sunset to reduce risks to the animal such as disorientation or attack from predators. The receptacle will be kept in a shaded or otherwise suitable location during the day so that the temperatures experienced by the animals are well within its normal range. At all times, the receptacle will be kept in a secure location, under the supervision of the ecologist/wildlife carer.

4.2.6 Management of captured native animals - injured

The following methods will be followed for the management of injured native fauna:

- A list of contact details of local veterinarians should be compiled prior to construction
- If an injured animal is found then the ecologist/wildlife carer will immediately take this animal to a nearby veterinarian for assessment
- For animals whose injuries can be treated and that stand a good chance of a successful return to the wild (as determined by the veterinarian), they will be placed into the care of a local and 'accredited party' if they are experienced in the care of that particular animal species
- For particular species of injured animals where the local accredited party is not qualified in their care and recovery, alternative accredited party(s) will be arranged from a wider area
- If there are animals for which no suitable accredited parties can be found, advice will be sought from OEHL will be sought on an appropriate solution
- When injured animals have recovered sufficiently, they will be released safely at the point of capture or a nearby area outside the construction zone by the ecologist/wildlife carer in suitable habitat

- Animals whose injuries have a poor chance of treatment or for which a successful return to the wild is considered unlikely (as determined by the veterinarian) will be euthanised humanely by the veterinarian.

4.2.7 Management of captured native fauna - deceased animals

The ecologist/fauna handler will offer deceased animals to the Australian Museum. If the Museum rejects some or all of the specimens, then the specimens will be offered to OEH. If both parties reject the specimens, then the specimens will be disposed of thoughtfully and hygienically- either buried or securely wrapped and disposed of in the waste collection.

In the event that the animal has sustained considerable damage rendering it unsuitable as a museum specimen the specimens will be disposed of in accordance with the above practice.

4.2.8 Reporting and documentation

Records of all native animals that are handled, or otherwise managed, will be maintained on a project register or database (including both dead and living individuals). Data to be recorded includes:

- Date and time of the sighting and details of the observer
- Location of the sighting (including GPS coordinates)
- Species name
- Number of individuals recorded
- Condition of the animal (living/dead/injured/sick)
- Vegetation type in which the animal was recorded
- Biological information (where possible) including the age, sex, breeding condition and size
- Management action undertaken (e.g. captured, handled, taken to vet)
- Results of any management actions (e.g. released, euthanised, placed with carer).

Records of all sightings will be supplied to OEH quarterly for inclusion on the NSW Wildlife Atlas database. Records of all handled, dead or injured animals will also be submitted to OEH and the Animal Welfare Branch of DPI NSW at the completion of the construction phase.

5. Monitoring Effectiveness of Management Actions

- The Site Environmental Advisor will oversee slashing/clearing in accordance with the above procedures.
- Compliance with the above management procedures shall be evaluated using Form P01 Weekly Site Inspections and Forms A01 and A02 (attached).
- If evidence of mortality through collision with the perimeter fence is collected, this will be examined to determine whether there are specific hot spots. If required, measures will then be employed to make the fence more visible at these locations. In the first instance these measures would include the installation of aerial marker balls or high visibility surveyor's flagging ribbon. These hot spots would then be continually monitored on a weekly basis during the Construction Phase to determine their effectiveness.
- If evidence of animal mortality in post holes or trenches is collected, this should be examined to determine the reason (e.g. hot weather, flooding, insufficient monitoring frequency). Impacts can be further mitigated by increasing the monitoring frequency and reducing the amount of concurrently open holes and trenches.

It is noted that some of the monitoring associated with the above will extend beyond the construction period and as such, will fall outside the control/responsibility of First Solar. It would be proposed to continue this monitoring effort, post construction, with the responsibility for doing so transferring across to AGL as the owner/operator of the solar farm. It is anticipated that detail (and continuity) of the monitoring program will be achieved through incorporating these measures into the solar farm's Operational Environmental Management Plan (OEMP).

The OEMP, pursuant to Consent Condition C4 of the Minister's approval, must be submitted to the Director General no later than one month prior to the commencement of Operation of the development or within such period as otherwise agreed to by the Director General.

First Solar, as part of its handover arrangements with AGL, will provide a summary of all monitoring undertaken during the Construction Phase.

6. Responsibilities

Project Manager

- Advising the AGL Project Manager of the actual areas impacted by construction to inform the Biodiversity Offset Management Package.

Construction Manager

- Completion of Worker Environmental Awareness and Compliance Training.
- Ensuring all slashing/clearing works are conducted in accordance with the above management procedures.
- Control and monitoring of site disturbance extents within the footprint of the solar farm.

Site Environmental Advisor

- Completion of Worker Environmental Awareness and Compliance Training.
- Oversee slashing/clearing and coarse woody debris placement in accordance with the above procedures.
- Oversee activities and monitoring conducted by the Project Ecologist / Fauna Handler.

Project Ecologist / Fauna Handler

- The project ecologist must hold an appropriate qualification and experience in the identification of native and introduced flora and fauna within the Broken Hill area. The Project Ecologist may also be able to function as the fauna handler, subject to holding or gaining appropriate permits to allow for handling of native and introduced animals within NSW.
- The fauna handler must hold an appropriate qualification or experience in the identification of native and introduced fauna within the Broken Hill area. The handler must hold or gain the appropriate permits to allow for handling of native and introduced animals within NSW. The Fauna Handler may also function as Project Ecologist, if the person is a qualified ecologist who is also familiar with the flora and vegetation types of the area.
- Provide input relating to ecological obligations for the Worker Environmental Awareness and Compliance Training.
- Conduct pre-disturbance surveys as specified in Section 4.1.2.
- Undertake any and all handling and relocation of native fauna.
- Undertake daily monitoring of occupancy at the raptor nest to the west of the construction area, following procedures specified in Section 4.1.9 and the Raptor Management Plan.

- After felling, re-check HBTs to ensure no animals have become trapped or injured during slashing/clearing operations.
- Have a presence on site during slashing/clearing activities.
- Post clearing reporting.
- Maintain relevant records including fauna interactions forms.

Project Surveyors

- Measure and record with GPS the exact areas impacted by construction to ensure that the actual, not estimated area is offset in the Biodiversity Offset Plan.

Supervisors

- Completion of Worker Environmental Awareness and Compliance Training.
- Ensuring all slashing/clearing works are conducted in accordance with the above management procedures.

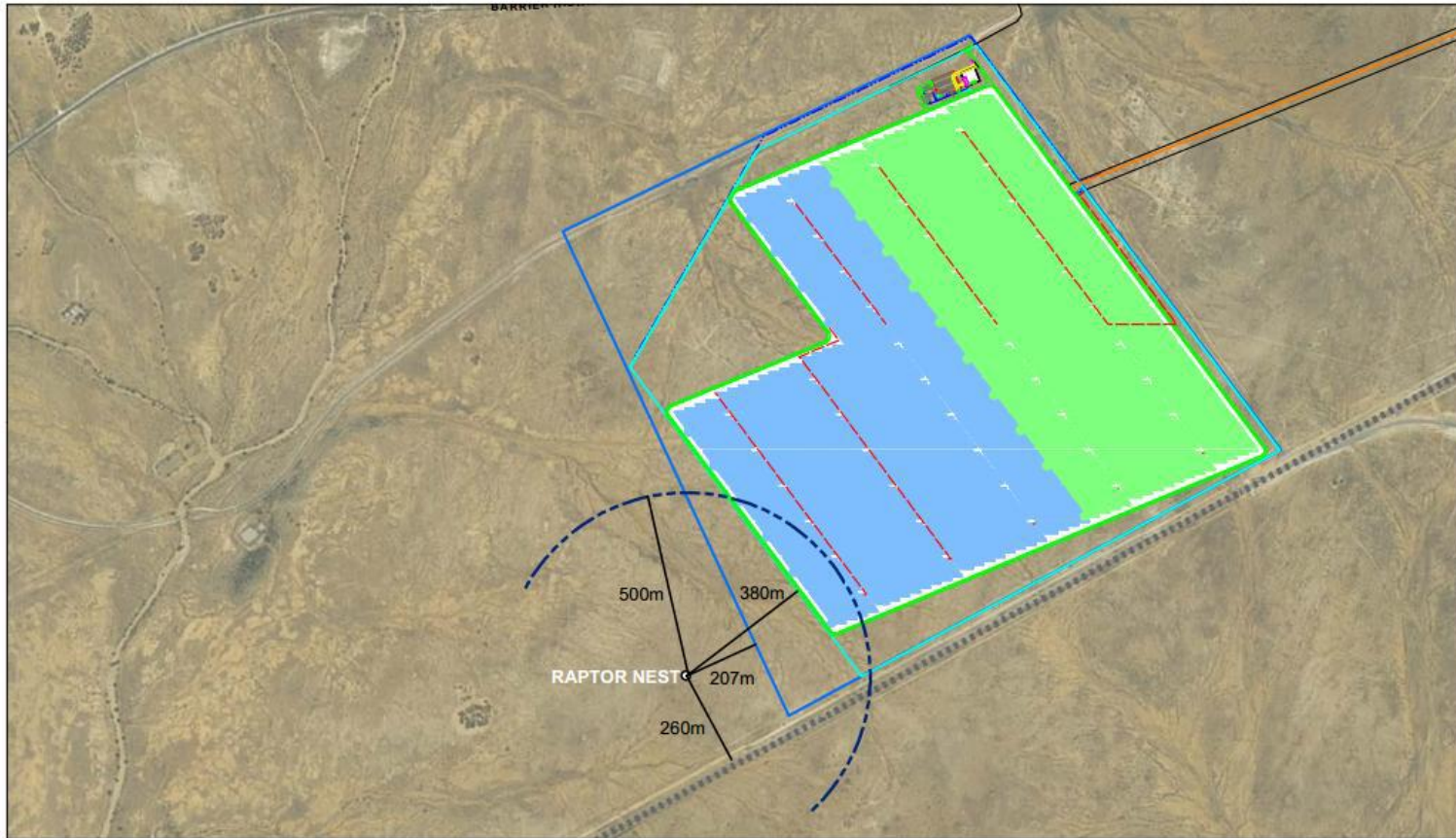
Construction Crew, Contractors and Sub-contractors

- Completion of Worker Environmental Awareness and Compliance Training.
- Ensuring all slashing/clearing works are conducted in accordance with the above management procedures.

7. Records

- Form A01: Perimeter fence and nest box monitoring record.
- Form A02: Fauna handling record.

Figure-A01: Bounds of Potential Vegetation Slashing/Clearing within the Construction Footprint



Proximity of Raptor Nest Site to Proposed Broken Hill Solar Plant

- Solar plant fence line
- Property boundary
- Rail line
- Indicative 500m buffer



GDA 1994 | MGA Zone 54



SINCLAIR KNIGHT MERZ

\\HARIBU\Projects\4A01780\10\Technical\Spatial\GIS\GIS_Directory\Arctap\Drawings\SF_GIS_BH_D000_R03V1.mxd
Spatial Team • Prepared by: JC
Checked by: PF

Figure-A02 Raptor nest identified west of the project site (SKM 2013)



Figure-A03: Cut/Fill Model

FORM-A01: Fauna entrapment monitoring record

Date	Fauna entrapment (Y/N)			If yes, what location and species?	Actions
	Perimeter fence	Trench	Hole		

To be completed monthly.

Photocopy form as required.



FORM – A02: ANIMAL HANDLING RECORD

No:	Time:
Date:	Location:

GPS coordinates:

Species name and number of individuals:

Condition of the animal: Living: Dead: Injured: Sick: Other:
Other:

Vegetation type in which the animal was recorded:

Biological information (where possible) including age, sex, breeding condition and size:

Management action: Captured: Handled: Taken to vet: Other:
Other or comment:

Result of management action: Released: Euthanised: Placed with carer: Other:
Other or comment:

Recorded by:
Name: Signature:



Sub-plan B – Ground Cover Management Plan



CEMP- Sub-plan B – Ground Cover Management Plan

1. Objectives

This Ground Cover Management Plan describes the procedures to establish and maintain vegetation cover and composition beneath the solar arrays of the Broken Hill PV Power Station development.

The objectives of this plan are to:

- Minimise disturbance to groundcover not impacted by the project, particularly areas of native shrubland in good condition
- Minimise biodiversity impacts by establishing and maintaining native ground cover, where feasible
- Stabilise, rehabilitate and revegetate disturbed ground cover
- Retain groundcover within the construction footprint of the power station where possible to minimise soil erosion and dust generation impacts, while maintaining a workable surface
- Implement weed control measures to control and prevent the spread of noxious weeds
- Establish, maintain and monitor ground cover beneath the solar arrays and implement corrective actions if ground cover management goals are not achieved.

2. Approval Conditions and Commitments

This Ground Cover Management Plan has been prepared to meet the requirements of:

- The Broken Hill Solar PV Power Station Project Approval (MP10-0202)
 - Condition C3(b)
- Broken Hill Solar Plant Submissions and Preferred Project Report (SKM, February 2013)
 - Commitment V1
 - Commitment V2
 - Commitment FF1
 - Commitment FF9
 - Commitment W9.

3. Plan Development

This plan draws on that prepared (and approved) for the Nyngan Solar PV Power Station development. However, the Broken Hill site features native chenopod shrubland in good condition so a key measure of this plan is to minimise disturbance to these areas outside the construction footprint.

Input to this plan on suitable ground covers for the Broken Hill site has been provided by Matthew Gibson of Biosis Pty Ltd. Matthew Gibson is a Senior Consultant Botanist and Resource Group Manager with over 15 years' experience in the survey and management of native vegetation. The Crown Lands Division of the Department of Trade and Investment agreed with this approach (Contact: Andrew Bell and documentation of consultation provided in Appendix F of the CEMP).

Findings of the Director General's Environmental Assessment Report relevant to this plan are:

- Whilst not all low groundcover vegetation would require removal it is likely to be compromised in the long term due to permanent shade from the solar panels
- The project has the potential to change the vegetation assemblages over time which may favour weed species, and therefore management plans should include measures to control and prevent the spread of weeds
- The Proponent be required to: undertake field trials in consultation with an agronomist as part of the Ground Cover Management Plan to ensure adequate ground cover exists beneath the solar array
- A Ground Cover Management Plan has also been recommended to ensure soils are stabilised and to reduce soil erosion.

This Ground Cover Management Plan is linked to the Flora and Fauna Management Plan (CEMP Sub-plan A) and the Revegetation and Rehabilitation Management Plan, which is provided in Section 9.5.2 of the CEMP document.

Ground disturbance onsite will also be managed in accordance with the:

- Soil and Water Management Plan
- Air Quality Management Plan
- Vehicle Movement Management Plan which forms part of the First Solar Broken Hill Site Safety Plan.

4. Site Environmental Conditions

The project is based on Crown Land which is held in a perpetual lease by Western Lands for grazing purposes. There are no agricultural activities currently undertaken within the boundaries of the project site. The existing house and shed within the site (as identified within the EIS) will be relocated prior to construction commencing.

The majority of the study area supports remnant vegetation in a natural condition with some disturbance from selective vegetation clearing, track formation and minor weed invasion as a result of past land uses (SKM, 2012). The vegetation cover at the site is dominated by chenopod shrublands with some small areas also supporting sparse shrublands, dominated by wattle species.

The site surface soils comprise clays with a sand and gravel fraction (SKM, 2012). The soil thickness ranges from 0.8m to 1.3m with the underlying layer of rock at shallow depth.

The Broken Hill area experiences a mild to hot climate with most rain falling during summer and spring (SKM, 2012). The mean daily maximum temperature during summer is 33°C while in winter mean daily maximum temperatures drop to 4.8°C. The driest month is June (mean monthly rainfall of 15.2 mm) and the wettest month is October (mean monthly rainfall of 26.3 mm). Mean annual wind speed is 18.2 km/hr at 9am and 19.0 km/hr at 3pm, and is predominantly from the south.

5. Ground Cover Management

5.1 Minimisation of Ground Cover Disturbance

- Survey the site (in accordance with the final site layout civil design) prior to any construction works to restrict the disturbance of ground cover as much as practical.
- Mark out the environmental signage and exclusion areas defined by the Flora and Fauna Management Plan (and pre-construction surveys) and the final site layout civil design.
- Construct the perimeter security fence to restrict site access.
- Designate access tracks and internal roads for use by vehicles and mobile plant.
- Revegetate and restore areas of the project site (outside the impact footprint) that have been disturbed by the construction activities (refer to Revegetation and Rehabilitation Management Plan, Section 9.5.2 of the CEMP).
- Maintain bunting, flagging and signage and replace damaged materials.
- Site Environmental Advisor to undertake periodic and random compliance inspections.

5.2 Preparation of Site Array Areas

The general process for preparing the solar PV array areas prior to the installation of power station infrastructure (i.e. post, tilts, tables and PV modules) is listed below:

- Retain as much existing ground cover as possible
- Undertake slashing to reduce ground cover to a manageable height if practicable (the alternative will be to use a scraper to blade off shrubland above the ground surface)
- Undertake slashing/clearing of shrubs in a staged approach as required for progressive construction of the array blocks for best practice ground cover management while achieving a workable ground surface for post installation
- Use shredded groundcover to gain a working surface for construction (successfully demonstrated at Nyngan)
- Minimise the area of topsoil stripping
- Undertake cut and fill on localised high points only as per the cut and fill civil drawing (refer soil and water management plan).

Topsoil will not be removed from the array areas during construction works to minimise the damage to soil structure and success of revegetation and to maximise the use of this resource without impacting construction (i.e. it would be impractical to respread topsoil across the site once the power station infrastructure has been installed).

5.3 Temporary Stabilisation Works

- Avoid clearing areas that will remain unattended for more than 30 days during construction works.
- Install temporary stabilisation works on exposed areas with greater than 4% grade¹ or during high rainfall periods.
- Install temporary stabilisation works on exposed areas that remain unattended for more than 30 days during construction works.
- Temporary stabilisation works include:
 - Exclusion areas for pedestrians and vehicles
 - Use of geotextile materials or reinforced turf to stabilise exposed surfaces subject to concentrated flows
 - Check dams in drainage channels where ground cover vegetation is not established.

¹ <4% considered to have low erosion hazard, Figure 4.6, Landcom (2004)

5.4 Establishment and Stabilisation of Ground Cover

Where practicable, revegetation of disturbed ground cover will be undertaken progressively during construction of the solar arrays. There are a number of revegetation methods that may be used.

The strategy for establishing ground cover beneath the solar arrays, in order of preference and provided sediment and erosion control measures are in place, is listed below:

- Revegetation through natural regeneration
 - Advantages – colonisation with locally occurring species for soil stabilisation and reduction in potential for soil erosion and dust generation
 - Disadvantages – may include noxious weeds if they are present in the vicinity
- Active regeneration
 - Advantages – increase biodiversity with native species, seed sowing mix should be weed free
 - Disadvantages – may take longer to access seed stock or establish depending on environmental conditions at time of sowing.

5.4.1 Revegetation through natural generation

The strategy is to utilise the topsoil retained during the site preparation works. Reuse of topsoil is an effective form of encouraging vegetation through natural regeneration because:

- A source of seeds and propagules exist within the soil seed bank
- Species of local provenance are adapted to the environmental conditions in the area
- Soil fauna, fungal and microbial organisms that are essential to a healthy plant growing environment are already present.

Regeneration from respreads topsoil shall be encouraged through regular watering and weed management (refer Sections 5.5 and 6). The procedure for natural regeneration is to:

- Manually distribute the topsoil across the treated areas with minimum disturbance to the soil structure prior to the re-commencement of construction works
- Advise construction workers of ground that has been treated so that trampling may be avoided
- Implement maintenance and watering program
- Implement weed management.

5.4.2 Active regeneration

The procedure to be followed is provided below:

- Undertake sowing with a native ground cover mix that is consistent with the pre-construction environment and intended end use of the project site (e.g. grazing)
- Apply seeds at a rate of 1 to 2 kg seed per hectare
- Water seeded areas regularly to encourage germination and establishment of ground cover.
- Locally endemic species that are suitable for active regeneration are common locally indigenous perennial species known to occur within the site
- Perennial indigenous tussock grasses:
 - Speargrass – *Austrostipa scabra*
 - Bottle Washers – *Enneapogon avenaceus*
 - Leafy Nineawn – *Enneapogon polyphyllus*
 - Mallee Lovegrass – *Eragrostis deilsii*
 - Woollybutt Grass – *Eragrostis eriopoda*
 - Wallaby Grass – *Austrodanthonia caespitosa*
 - Queensland Bluegrass – *Dicanthium sericeum*
 - Bunched Kerosene Grass – *Aristida contorta*
 - Scent Grass – *Cymbopogon ambiguus*

Some of the species listed above may be available from local indigenous nurseries. However, the procedure for acquiring stock for most of these species should involve seed collection within the site or surrounding areas.

It is not proposed to actively plant shrubs beneath the arrays, but it is expected that colonisation will occur through natural regeneration processes. If it is determined by a Project Ecologist that shrubs should be included in the ground cover mix, then appropriate species are:

- Medium and small indigenous perennial shrubs:
 - Bladder Saltbush – *Atriplex vesicaria*
 - Cottony Saltbush – *Chenopodium curvispicatum*
 - Silver Tails - *Ptilotus obovatus* var. *obovatus*
 - Black Bluebush – *Maireana pyramidata*
 - Pearl Bluebush – *Maireana sedifolia*
- Spreading or prostrate indigenous shrubs:
 - Ruby Saltbush – *Enchylaena tomentosa*
 - Silky Bluebush – *Maireana villosa*
 - Broken Hill Pea – *Swainsona fissimontana*
 - Corrugated Sida – *Sida corrugata*
 - Climbing Twinleaf – *Zygophyllum eremaum*

As for the grasses described above, the procedure for acquiring stock should involve seed collection within the site or surrounding areas, propagation by a nursery and planting on site.

5.4.3 Trial of Regeneration Areas

The construction of the solar PV power station is a sequential modular process that will take about 12 months. Therefore, the strategy will be to use the initial regeneration areas as field trials for subsequent regeneration areas.

The regeneration areas will be determined by the size of the solar arrays. The initial approach will be to facilitate natural regeneration in the first row using the methods described in Section 5.4.1 and active regeneration in the second row using the methods described in Section 5.4.2.

This approach and method may be modified by a Project Ecologist undertaking ground cover monitoring throughout the construction period. Modifications could include a combination of both approaches.

It is proposed to undertake topsoil re-spreading and/or active sowing approximately 1-4 weeks prior to construction to avoid plants being acclimatised to full sunlight and natural rainfall.

Subsequent rows should be managed using natural regeneration unless the field trials undertaken in Row 1 are unsuccessful. If active regeneration is also unsuccessful then evaluation of the benefits and likelihood of success of hydro seeding will be undertaken.

5.5 Watering

Watering of ground cover works will be undertaken to ensure that an adequate survival and establishment rate is achieved. Watering is to abide by any local authority water restrictions or guidelines. During the twelve month construction period, the frequency of watering to achieve plant establishment will depend on the prevailing climatic conditions at the time of planting and thereafter. Watering will generally be carried out in the cooler hours of the day, namely morning or evening, and will be frequent enough to prevent wilting of plants.

The following watering program is recommended:

- Weeks 1 -4: 1 visit weekly
- Weeks 4- 12: 1 visit fortnightly
- Months 3-6: 1 visit monthly
- Months >6: 1 visit three monthly.

The necessity for watering during the above program will be dependent upon rainfall. The frequency of watering will be gradually reduced as the plantings mature and it is anticipated that after a period of 4 – 6 months the planting will be sufficiently established such that supplementary watering will no longer be required.

6. Weed Management Measures

6.1 Noxious Weeds

A vegetation survey was undertaken at the site (SKM, 2012). A total of 129 plant species were identified from 32 families. Of the total number of species recorded a total of 19 (15%) were introduced species. One noxious weed species, Velvet Mesquite *Prosopis velutina*, was recorded within the site. All species of *Prosopis* are listed as Weeds of National Significance.

6.1.1 Control of Velvet Mesquite

The distribution of this species within the site should be mapped and an eradication and monitoring program established prior to commencement of site preparation works. Topsoil from areas infested with Velvet Mesquite should not be reused for ground cover establishment. This soil would need to be segregated, stockpiled, monitored and treated as required.

The Velvet Mesquite control program will include:

- Survey of the site to map all infestations
- Mechanical removal of mature plants (either by hand or with light machinery)
- Destruction of material following removal of cut plants from the site, avoiding the spread of seeds to unaffected areas
- Annual monitoring of control areas, followed by removal of suckers and seedlings as required.

The focus of the First Solar weed management measures will be to remove Velvet Mesquite from the site and prevent the introduction of other noxious weed species on to the site during ground cover establishment.

6.1.2 Disposal of noxious weeds

Noxious and invasive weeds will be collected in plastic bags to the extent possible and disposed of at a licensed green waste disposal facility or a landfill.

This disposal will be undertaken in consultation with Broken Hill City Council to ensure that the weeds are disposed of appropriately. It is noted that the Broken Hill City Council offers weed disposal services to the local Broken Hill community.

6.1.3 Information on noxious weed classes and declarations

A full list of noxious weed species in the Broken Hill City Council area is provided in Attachment B01.

Information on the New South Wales noxious weed classes is provided in Attachment B02.

Appropriate control methods for noxious weeds can be located on the Macquarie Valley and Lachlan Valley weed advisory website:

http://www.westernweeds.org/index.php?act=contacts_detail&group=28.

6.2 Construction Phase Weed Control

6.2.1 Pre-construction

1. A pre-construction noxious weed inspection will be undertaken of the site.
2. The results of the weed inspection are to be provided to the Environmental Representative. The report should include actions required to manage weeds based on findings of the inspection.
3. Weeds will be physically removed from beneath solar arrays where possible to minimise potential herbicide contamination of topsoil to be used for regeneration.
4. Velvet Mesquite is to be controlled as outlined in Section 5.3.
5. Pre-construction herbicide control will be undertaken (if required) by licensed contractor prior to site disturbance on areas outside the solar arrays.
6. Herbicide control will focus on areas that will be disturbed during the development of laydown areas, access tracks and other works where distribution by vehicles and mobile plant is possible.

6.2.2 During Construction

Weed hygiene practices would be adopted to prevent the introduction of weeds in accordance with the *Noxious Weeds Act 1993*. Weed hygiene practices include:

- Vehicle weed hygiene
- Plant and equipment weed hygiene
- Sourcing materials such as sand and gravel certified weed free from suppliers.

A Weed Hygiene Declaration is a document used for vehicles or items with attached soil or organic material that may contain weeds and weed seeds. These are legal declarations from the owner / operator of the vehicle, plant or equipment that is entering the site the vehicle/plant or equipment has been checked for, and cleared of, weeds.

The following methods will be adopted to ensure that the above listed weed hygiene practices can be met:

1. Vehicles, plant and / or equipment will be inspected upon entrance to the site.
2. Inspections will be undertaken by the Site Environmental Advisor or a person who is qualified or experienced to undertake 3rd party contaminated machinery inspections.
3. Visiting vehicles, plant and / or equipment that remain on gravelled sections of the site and do not travel beyond these areas do not require a Weed Hygiene Declaration, except where caked mud / soil / vegetative matter is observed that may pose a contamination risk.
4. Gravel will be sourced from a certified weed free supplier.
5. Visibly dirty (e.g. items with soil, vegetative matter) vehicles, plant and equipment that need to travel on to the unsealed dirt sections of the site that do not possess a valid Weed Hygiene Declaration will not be permitted to enter the Broken Hill solar plant construction site.
6. The person responsible for the vehicle, plant and/ or equipment will be advised of their responsibilities with respect to the spread of weeds and will be asked to remove the item from site until they are can provide a valid Weed Hygiene Declaration.

7. Once passing the site entry inspection, a green sticker will be placed on the vehicle, plant or equipment to confirm that they were certified weed clean upon entering the site. This sticker will be dated.
8. Once certified, site based plant and equipment will be deemed weed clean until they leave the site. Once vehicles, plant and/or equipment are removed from site it will be required to be re-inspected upon re-entry to the site.
9. Operators will be warned of the risk posed by the Class listed species identified on site and the need to remain on approved disturbed areas while driving on the site to minimise contamination risk.
10. All contractors and personnel accessing the site will undertake an Environmental Awareness and Compliance Training induction (WEAC) session, which includes:
 - Weed spread prevention and contractor obligations
 - Information on the entry and certification process for vehicles, plant and equipment entering the Broken Hill Solar PV Power Station site
 - Information on known noxious weeds on the Broken Hill Solar PV Power Station siteRelevant noxious weed identification charts will also be posted within site buildings for reference by site personnel.
11. Construction materials will be sourced from certified weed free suppliers to prevent the introduction of noxious weeds to the Broken Hill Solar PV Power Station site.
12. Soil stockpiles will be monitored for the emergence of declared noxious weeds and treated as per the procedure outlined in Section 6.1.
13. Disturbed areas will be monitored for the emergence of declared noxious weed species and treated as per the procedure outlined in Section 6.3.
14. Topsoil stripped from disturbance areas will be managed and stockpiled in a manner that preserves the organic properties of the soil as far as practicable to facilitate rapid revegetation during rehabilitation. Rapid regeneration with beneficial species will help to prevent opportunity for weed infestation.
15. Site stabilisation would be undertaken progressively during works to ensure that soils are stabilised as soon as practical. This would minimise weed infestation and the potential for sedimentation and erosion.

6.2.3 Post Construction Weed Management

Post Construction Phase weed control will be managed in accordance with the Operational Environmental Management Plan (OEMP). The OEMP will be developed by the Proponent (AGL) in accordance with Condition C4 of the Development Consent.

The ongoing control of declared noxious weeds would be actively managed consistent with requirements of the *Noxious Weeds Act 1993*. The Act imposes obligations on occupiers of land to control noxious weeds declared for their area.

7. Monitoring of Development Impact on Ground Cover

The objective of this section is to describe how the potential impact on the development on ground cover will be monitored. Photographic records of ground cover will be taken regularly during the construction phase to allow comparison of ground cover % and condition.

The site will be inspected as required by the Project Ecologist to monitor regeneration of ground cover beneath the arrays. The performance indicators will be:

- % dieback of native shrublands outside project boundaries and adjacent to access roads
- % noxious weeds in array areas, along access roads and along perimeter fence.

The project life will be approximately 25 years. The long term groundcover at the site can only be speculated upon. Changes to micro-climatic conditions and shading under the arrays will have an unknown effect. Consistent with the findings of the environmental assessment for the project, the best means of managing any future impact will be through monitoring and adaptive management during the lifetime of the project.

It is expected that some native groundcover species will gain a competitive advantage from the altered conditions and this may result in the species composition beneath the PV array, following recovery, being different to that of surrounding areas. The development may also benefit some common undeclared introduced weed species, but any change in species composition is unlikely to extend beyond the site.

8. Review and Corrective Actions

8.1 Review

This ground cover management plan will be reviewed monthly and updated if required by advice provided by the Project Ecologist.

8.2 Corrective Actions

- Implement additional sediment and erosion control measures if exposed soils for revegetation and rehabilitation have been affected by surface water flows.
- Cordon off or restrict access to any areas where dieback of shrublands is observed outside the construction footprint.
- Engage a Project Ecologist to provide advice if ground cover establishment is not evident within 30 days of start period of trials or regeneration period (i.e. completion of works and soil disturbance).
- Engage a Project Ecologist to undertake a field trial of hydro seeding in areas where natural regeneration or active regeneration has not commenced within 60 days of start period.
- Engage a Project Ecologist if an outbreak of an unknown plant is observed.
- Request new weed hygiene declarations if a noxious weed outbreak is identified.
- Engage licensed weed contractor in the event of a noxious weed outbreak.

9. Responsibilities

Project Manager

- Completion of Worker Environmental Awareness and Compliance Training.
- Engagement with relevant stakeholders (as required).
- Compliance with the Broken Hill site weed hygiene requirements.

Construction Manager

- Completion of Worker Environmental Awareness and Compliance Training.
- Control and monitoring of site disturbance extents.
- Ensuring vehicles, plant and / or equipment arrive to site weed free.
- Ensuring sub-contractors and site personnel are aware of and comply with the site entry requirements.
- Ensuring sub-contractors and site personnel comply with weed management methods.
- Ensuring weed free construction materials are used.
- Compliance with the Broken Hill site weed hygiene requirements.

Site Environmental Advisor

- Completion of Worker Environmental Awareness and Compliance Training.
- Completion of weekly site inspections.
- Undertake periodic and random spot checks to audit against compliance.
- Photographic monitoring of areas of ground cover regeneration under the solar arrays and disturbance outside the construction footprint.
- Engage Project Ecologist at establishment of ground cover regeneration trials and as required to address establishment issues or redesign the program.
- Update the Broken Hill City Council noxious weeds list (Attachment I02) every 12 months.
- Management of weed hygiene methods, including site entry requirements.
- Compliance with the Broken Hill site weed hygiene requirements.

Supervisors

- Completion of Worker Environmental Awareness and Compliance Training.
- Reporting the presence of noxious weeds to the Construction Manager and Site Environmental Advisor.
- Compliance with the Broken Hill site weed hygiene requirements.

Construction Personnel, Contractors and Sub-contractors

- Completion of Worker Environmental Awareness and Compliance Training.
- Reporting the presence of noxious weeds to the Construction Manager.
- Compliance with the Broken Hill site weed hygiene requirements.



10. Records

- Records of weekly site inspections will be maintained on Form P01.
- Photographic records of ground cover establishment beneath PV arrays.
- Records of weed management activities will maintained on Form-I01 (attached).



Attachment B01: Control Classes of Noxious Weeds

New South Wales noxious weed control classes.

Control class	Weed type	Example control requirements
Class 1	Plants that pose a potentially serious threat to primary production or the environment and are not present in the State or are present only to a limited extent.	The plant must be eradicated from the land and the land must be kept free of the plant. The weeds are also "notifiable" and a range of restrictions on their sale and movement exist.
Class 2	Plants that pose a potentially serious threat to primary production or the environment of a region to which the order applies and are not present in the region or are present only to a limited extent.	The plant must be eradicated from the land and the land must be kept free of the plant. The weeds are also "notifiable" and a range of restrictions on their sale and movement exist.
Class 3	Plants that pose a potentially serious threat to primary production or the environment of a region to which the order applies, are not widely distributed in the area and are likely to spread in the area or to another area.	The plant must be fully and continuously suppressed and destroyed.*
Class 4	Plants that pose a potentially serious threat to primary production, the environment or human health, are widely distributed in an area to which the order applies and are likely to spread in the area or to another area.	The growth of the plant must be managed in a manner that reduces its numbers spread and incidence and continuously inhibits its reproduction*
Class 5	Plants that are likely, by their sale or the sale of their seeds or movement within the State or an area of the State, to spread in the State or outside the State.	There are no requirements to control existing plants of Class 5 weeds. However, the weeds are "notifiable" and a range of restrictions on their sale and movement exists.

Source:

<http://www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/definition>

Attachment B02: Noxious weed declarations for Broken Hill City Council

The following weeds are declared noxious in the control area of Broken Hill City Council.

Weed	Class	Legal requirements
African boxthorn [<i>Lycium ferocissimum</i>] A Weed of National Significance	4	The growth of the plant must be managed in a manner that reduces its numbers spread and incidence and continuously inhibits its reproduction
African feathergrass [<i>Pennisetum macrourum</i>]	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration
African turnip weed [<i>Sisymbrium runcinatum</i>]	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration
African turnip weed [<i>Sisymbrium thellungii</i>]	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration
Alligator weed [<i>Alternanthera philoxeroides</i>] A Weed of National Significance	2	The plant must be eradicated from the land and the land must be kept free of the plant
Anchored water hyacinth [<i>Eichhornia azurea</i>]	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Annual ragweed [<i>Ambrosia artemisiifolia</i>]	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration
Arrowhead [<i>Sagittaria montevidensis</i>]	4	The plant must not be sold propagated or knowingly distributed This is an All of NSW declaration
Artichoke thistle [<i>Cynara cardunculus</i>]	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration
Athel pine [<i>Tamarix aphylla</i>] A Weed of National Significance	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration
Bear-skin fescue [<i>Festuca gautieri</i>]	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration
Black knapweed [<i>Centaurea nigra</i>]	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Blackberry [<i>Rubus fruticosus aggregate species</i>] except cultivars Black satin Chehalem Chester Thornless Dirksen Thornless Loch Ness Murrindindi Silvan Smooth stem Thornfree	4	The growth of the plant must be managed in a manner that reduces its numbers spread and incidence and continuously inhibits its reproduction and the plant must not be sold propagated or knowingly distributed This is an All of NSW declaration
Boneseed [<i>Chrysanthemoides monilifera subsp. monilifera</i>] A Weed of National Significance	2	The plant must be eradicated from the land and the land must be kept free of the plant
Bridal creeper [<i>Asparagus asparagoides</i>] A Weed of National Significance	4	The plant must not be sold propagated or knowingly distributed
Broomrapes [<i>Orobanche species</i>] Includes all Orobanche species except the native <i>O. cernua</i> variety <i>australiana</i> and <i>O. minor</i>	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration

Burr ragweed [<i>Ambrosia confertiflora</i>]	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration
Cabomba [<i>Cabomba species</i>] Includes all Cabomba species except <i>C. furcata</i> A Weed of National Significance	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration
Camel thorn [<i>Alhagi maurorum</i>]	4	The growth of the plant must be managed in a manner that reduces its numbers spread and incidence and continuously inhibits its reproduction
Cayenne snakeweed [<i>Stachytarpheta cayennensis</i>]	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration
Chilean needle grass [<i>Nassella neesiana</i>] A Weed of National Significance	4	The growth of the plant must be managed in a manner that reduces its numbers spread and incidence and continuously inhibits its reproduction and the plant must not be sold propagated or knowingly distributed
Chinese violet [<i>Asystasia gangetica subspecies micrantha</i>]	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Clockweed [<i>Gaura parviflora</i>]	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration
Columbus grass [<i>Sorghum x alnum</i>]	3	The plant must be fully and continuously suppressed and destroyed
Corn sowthistle [<i>Sonchus arvensis</i>]	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration
Dodder [<i>Cuscuta species</i>] Includes All Cuscuta species except the native species C. australis, C. tasmanica and C. victoriana	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration
East Indian hygrophila [<i>Hygrophila polysperma</i>]	4	The plant must not be sold propagated or knowingly distributed
Espartillo [<i>Amelichloa brachychaeta, Amelichloa caudata</i>]	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration
Eurasian water milfoil [<i>Myriophyllum spicatum</i>]	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Fine-bristled burr grass [<i>Cenchrus brownii</i>]	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration
Fountain grass [<i>Pennisetum setaceum</i>]	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration
Gallon's curse [<i>Cenchrus biflorus</i>]	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration
Glaucous starthistle [<i>Carthamus glaucus</i>]	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration
Golden dodder [<i>Cuscuta campestris</i>]	4	The growth of the plant must be managed in a manner that reduces its numbers spread and incidence and continuously inhibits its reproduction
Golden thistle [<i>Scolymus hispanicus</i>]	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration

Green cestrum [<i>Cestrum parqui</i>]	3	The plant must be fully and continuously suppressed and destroyed
Harrisia cactus [<i>Harrisia species</i>]	4	The growth of the plant must be managed in a manner that reduces its numbers spread and incidence and continuously inhibits its reproduction and the plant must not be sold propagated or knowingly distributed This is an All of NSW declaration
Hawkweed [<i>Hieracium species</i>]	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Heteranthera [<i>Heteranthera reniformis</i>]	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Horsetail [<i>Equisetum species</i>]	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Hydrocotyl [<i>Hydrocotyl ranunculoides</i>]	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Hymenachne [<i>Hymenachne amplexicaulis and hybrids</i>] A Weed of National Significance	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Johnson grass [<i>Sorghum halepense</i>]	3	The plant must be fully and continuously suppressed and destroyed
Karoo thorn [<i>Acacia karroo</i>]	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Kochia [<i>Bassia scoparia</i>] except <i>Bassia scoparia</i> subspecies <i>trichophylla</i>	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Koster's curse [<i>Clidemia hirta</i>]	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Lagarosiphon [<i>Lagarosiphon major</i>]	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Lantana [<i>Lantana species</i>] A Weed of National Significance	4	The plant must not be sold propagated or knowingly distributed
Leafy elodea [<i>Egeria densa</i>]	4	The plant must not be sold propagated or knowingly distributed This is an All of NSW declaration
Lippia [<i>Phyla canescens</i>]	4	The plant must not be sold propagated or knowingly distributed by any person other than a person involved in hay or lucerne production and the growth of the plant must be managed in a manner that reduces its spread and continuously inhibits its reproduct This is an All of NSW declaration
Long-leaf willow primrose [<i>Ludwigia longifolia</i>]	4	The plant must not be sold propagated or knowingly distributed
Mesquite [<i>Prosopis species</i>] All species of <i>Prosopis</i> are Weeds of National Significance. <i>Prosopis velutina</i> (Velvet Mesquite) has been recorded on the site (refer to Appendix B of the Flora and Fauna Assesment).	2	The plant must be eradicated from the land and the land must be kept free of the plant
Mexican feather grass [<i>Nassella tenuissima</i>]	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration

Mexican poppy [<i>Argemone mexicana</i>]	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration
Miconia [<i>Miconia species</i>]	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Mikania [<i>Mikania micrantha</i>]	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Mimosa [<i>Mimosa pigra</i>] A Weed of National Significance	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Mossman River grass [<i>Cenchrus echinatus</i>]	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration
Parkinsonia [<i>Parkinsonia aculeata</i>] A Weed of National Significance	2	The plant must be eradicated from the land and the land must be kept free of the plant
Parthenium weed [<i>Parthenium hysterophorus</i>] A Weed of National Significance	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Pond apple [<i>Annona glabra</i>] A Weed of National Significance	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Prickly acacia [<i>Acacia nilotica</i>] A Weed of National Significance	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Prickly pear [<i>Cylindropuntia species</i>] A Weed of National Significance	4	The growth of the plant must be managed in a manner that reduces its numbers spread and incidence and continuously inhibits its reproduction and the plant must not be sold propagated or knowingly distributed This is an All of NSW declaration
Prickly pear [<i>Opuntia species</i>] Includes all <i>Opuntia</i> species except <i>O. ficus-indica</i> A Weed of National Significance	4	The growth of the plant must be managed in a manner that reduces its numbers spread and incidence and continuously inhibits its reproduction and the plant must not be sold propagated or knowingly distributed This is an All of NSW declaration
Red rice [<i>Oryza rufipogon</i>]	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration
Rhus tree [<i>Toxicodendron succedaneum</i>]	4	The growth of the plant must be managed in a manner that prevents any above ground part the plant from encroaching within 2 metres of the property boundary and the plant must not be sold propagated or knowingly distributed This is an All of NSW declaration
Rubber vine [<i>Cryptostegia grandiflora</i>] A Weed of National Significance	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Sagittaria [<i>Sagittaria platyphylla</i>] A Weed of National Significance	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration
Salvinia [<i>Salvinia molesta</i>] A Weed of National Significance	2	The plant must be eradicated from the land and the land must be kept free of the plant
Senegal tea plant [<i>Gymnocoronis spilanthoides</i>]	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Serrated tussock [<i>Nassella trichotoma</i>]	4	The growth of the plant must be managed in a manner

A Weed of National Significance		that reduces its numbers spread and incidence and continuously inhibits its reproduction and the plant must not be sold propagated or knowingly distributed
Serrated tussock [<i>Nassella trichotoma</i>] A Weed of National Significance	4	The growth of the plant must be managed in a manner that reduces its numbers spread and incidence and continuously inhibits its reproduction and the plant must not be sold propagated or knowingly distributed This is an All of NSW declaration
Siam weed [<i>Chromolaena odorata</i>]	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Smooth-stemmed turnip [<i>Brassica barrelieri subspecies oxyrrhina</i>]	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration
Soldier thistle [<i>Picnomon acarna</i>]	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration
Spotted knapweed [<i>Centaurea stoebe subspecies micranthos</i>]	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Texas blueweed [<i>Helianthus ciliaris</i>]	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration
Tropical soda apple [<i>Solanum viarum</i>]	2	The plant must be eradicated from the land and the land must be kept free of the plant
Water caltrop [<i>Trapa species</i>]	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Water hyacinth [<i>Eichhornia crassipes</i>] A Weed of National Significance	2	The plant must be eradicated from the land and the land must be kept free of the plant
Water lettuce [<i>Pistia stratiotes</i>]	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Water soldier [<i>Stratiotes aloides</i>]	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Willows [<i>Salix species</i>] Includes all <i>Salix</i> species except <i>S. babylonica</i> , <i>S. x reichardtii</i> , <i>S. x calodendron</i>	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration
Witchweed [<i>Striga species</i>] Striga species except the native <i>Striga parviflora</i>	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Yellow burrhead [<i>Limnocharis flava</i>]	1	The plant must be eradicated from the land and the land must be kept free of the plant. This is an All of NSW declaration
Yellow nutgrass [<i>Cyperus esculentus</i>]	5	The requirements in the Noxious Weeds Act 1993 for a notifiable weed must be complied with This is an All of NSW declaration

Source:

<http://www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/noxweed>

Sub-plan C – Landscape Plan



CEMP Sub-plan C – Landscape Plan

1. Objectives

The objective of this Landscape Plan is to minimise the visual impacts from the Broken Hill Solar PV Power Station. The management strategies are to:

- Identify the landscaping objectives and standards, based on visual impacts and local environmental values (in particular 'The Pinnacles')
- Describe the species used to enhance, mitigate and/or augment landscaping to minimise the visual impact of the project, particularly with respect to the impacts on nearby residences
- Establish, maintain and monitor the landscaping plan to ensure the establishment and ongoing maintenance of landscaped areas
- Seek feedback from affected residents and the interested community on proposed landscape measures (refer to AGL's *Community Consultation Plan*).

This plan addresses Project Approval Condition C3(c).

This plan addresses commitments V4, V5, V6 and V7 of the SKM Submissions and Preferred Project Report (April 2013).

2. Potential Impacts on Landscape Values

2.1 Landscape Values

The landscape values of the existing environment were described in SKM (2012) *Broken Hill Solar Plant Environmental Assessment*. The solar power station will cover 200 ha of flat land between the Barrier Highway to the north and the Peterborough-Broken Hill railway line to the south. The major features of the landscape reported by SKM (2012) are summarised below:

- The landscape of the Broken Hill area has a distinctive weathered appearance, wide open spaces and deep red sands
- Much of the landscape has been transformed by mining activity
- To the north of Broken Hill, the Barrier Ranges comprise ridges up to 300 metres above the surrounding plains. The foothills of these ranges extend into the northern and central areas of Broken Hill and offer views across the landscape

- ‘The Pinnacles’ are a hard rock outcrop located approximately 5 km to the south west of the solar power station site. They are a highly valued topographical feature with indigenous and non-Indigenous significance and a local icon
- Other areas around the project site consist of undulating and flatter alluvial plains with a network of ephemeral watercourses and drainage lines
- The solar PV power station will be set on the northwest facing side of a shallow ridge, which helps to conceal views toward the site from the south and east
- The highest point on the site is 280 metres ADH on the south east corner and the lowest point is 270 metres on the north west corner
- The vegetation surrounding the project site comprises shrubland and grasses with a few sparsely distributed trees
- The existing vegetation would provide little visual screening of the solar PV power station site
- There are established banks of trees along roadsides closer to the township and in the conservation areas on the periphery of town
- Views toward the project site from Broken Hill are usually inhibited by the terrain, with the trees providing additional screening.

2.2 Visual Impact Assessment

The findings of the SKM (2012) visual impact assessment are summarised below:

- The only area where visual impact was predicted to be high is the Barrier Highway, close to the north east corner of the site, where it would impact views south west towards ‘The Pinnacles’
- The foreground has few manmade elements and the presence of the solar PV power station would result in a change to the visual characteristics of the landscape
- The visual impact of the solar PV power station from the Barrier Highway may be mitigated through planting low shrubby vegetation. This will inhibit the views of the solar PV power station (relatively low profile at 1.5 – 2 metres high) while maintaining views towards ‘The Pinnacles’
- It is more than 1 km from the nearest existing residential dwelling and unlikely to result in visual impacts to the local community or adjacent land uses
- There may be temporary visual aspects on landscape views during construction due to the presence of a construction site.

3. Landscape Plan

3.1 Strategy

This landscaping plan has been designed to mitigate the potential visual impacts on views from the Barrier Highway, south west towards 'The Pinnacles'. It describes the species to be used to enhance landscaping in order to minimise the visual impact of the project. As recommended by SKM (2012), planting of low shrubby vegetation along the northern and north eastern boundaries of the site will screen views of the solar PV power station from the Barrier Highway while maintaining views towards 'The Pinnacles'.

3.2 Landscape Areas and Timing

The northern and north eastern boundaries of the site will be planted with suitable species (see Section 3.3) between the Barrier Highway and the solar PV power station. Along the eastern boundary, landscaping will be undertaken between the solar plant boundary fence and the site boundary fence. Along the northern boundary, landscaping will be undertaken on the northern side of the access track.

The planting will be approximately 9 metres wide and 3 metres in height. The objective is to present a continuous screen when viewed from a passing vehicle. The locations of the landscape planting areas are shown in Figure C01.

The plantings shall be undertaken as soon as practicable to allow the plantings time to establish during the construction of the power station and begin to form a vegetative screen. To give the plants the best opportunity to establish, planting will be timed to avoid any site preparation activities that may impact the plants during the initial establishment period.

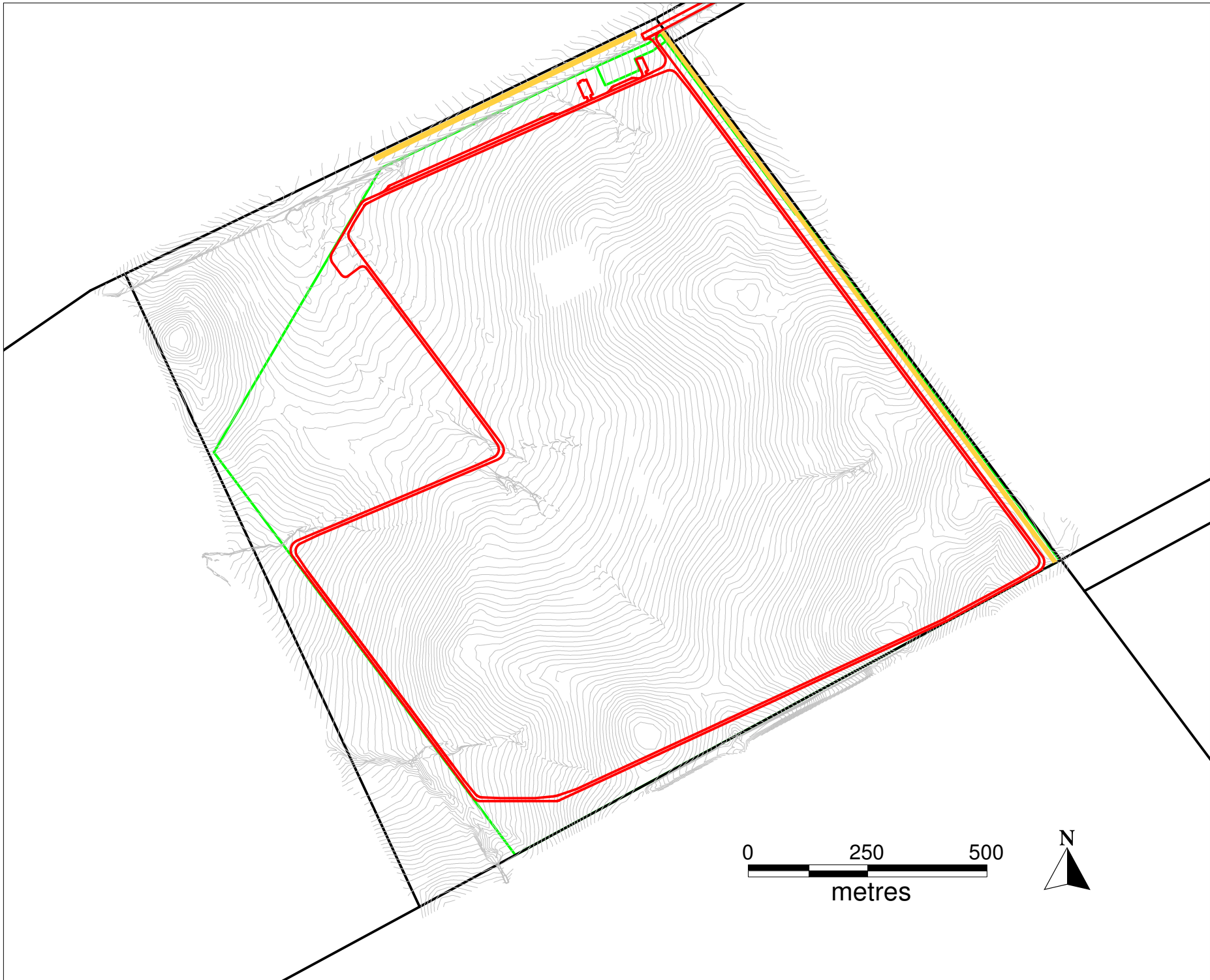
The plantings are designed for long term visual impact mitigation. The growth of the plantings should help to minimise visual impacts during construction over the 17 – 18 month period. The recommended species should be mature within 3 – 5 years.

Figure C01: Landscape Plan



Broken Hill Solar Park

Figure C01 Landscape Plan



- Property boundary
- Contour
- Boundary fence
- Roads
- Proposed low native shrubby planting



Figure produced by Biosis using data supplied by First Solar.

3.3 Landscape Species

It is proposed that endemic native species are chosen for landscaping. These species will be:

- Suited to the local environment
- Provide a suitably dense and high foliage cover to screen the power station infrastructure
- Enhance local biodiversity values through provision of additional habitat opportunities.

The landscape species recommended here are consistent with those identified in the Ground Cover Management Plan and the Rehabilitation and Revegetation Management Plan. Shrub species were chosen to achieve the effect of screening the solar PV power station while maintaining views to 'The Pinnacles' from the Barrier Highway.

Landscape plantings for visual screening will be predominantly large shrubs, with scattered plantings of small trees. Suggested species are listed below. All species recommended are either recorded on site or are present within the local area. As most planting is planned within relatively flat, sandy areas, planting of species preferring higher rocky sites (including Mulga *Acacia aneura* and Dead Finish *Acacia tetragonophylla*) is not recommended. It is expected that, provided growth conditions are favourable, most shrub species will require 3-5 years to reach mature height and circumference.

The recommended species are:

- Small trees – may eventually grow to over 10 metres but will be planted sparsely or in areas where they will not impede desired views:
 - Rosewood – *Alectryon oleifolius* subsp. *canescens*
 - Belah – *Casuarina pauper*
 - Leopardwood – *Flindersia maculosa*
- Large shrubs – typically 1-3 metres high by 1-2 metres wide when mature. Suitable for dense planting for visual screening:
 - Sand Hill Wattle – *Acacia burkittii*
 - Umbrella Wattle – *Acacia oswaldii*
 - Prickly Wattle – *Acacia victoriae* (recommended for planting in the low-lying area where the drainage line exits the property)
 - Silver Cassia Group – including *Senna artemisioides* subsp. *X artemisioides*, *Senna artemisioides* subsp. *X coriacea*, *Senna artemisioides* subsp. *filifolia*
 - Narrow-leaf Emu-bush – *Eremophila sturtii*
 - Western Boobialla – *Myoporum montanum*
 - Narrow-leaf Hopbush – *Dodonaea viscosa* subsp. *angustissima*
- Medium and small indigenous perennial shrubs (as specified in the Ground Cover Management Plan):
 - Bladder Saltbush – *Atriplex vesicaria*
 - Cottony Saltbush – *Chenopodium curvispicatum*

- Silver Tails - *Ptilotus obovatus* var. *obovatus*
- Black Bluebush – *Maireana pyramidata*
- Pearl Bluebush – *Maireana sedifolia*

4. Implementation of Landscape Planting

4.1 Planting Layout

The suitability of the proposed landscape species, in terms of visual screening and height, will be re-evaluated during implementation of this plan by the Site Environmental Advisor, revegetation/landscaping contractor, consultation with native local plant nurseries and community consultation.

Planting will be undertaken in the specified landscape areas to form a vegetation stand of approximately nine metres width. The shrubs and trees will be planted approximately three metres apart. Random plantings within this area, rather than rows, are recommended to present a continuous screen when viewed from a passing vehicle.

4.2 Planting Material and Methods

The use of tube stock seedlings is recommended. The species identified in Section 3.3 are generally available from native plant nurseries. Machine planting may be feasible in the open environment at Broken Hill. However, hand planting may produce a better result and should be utilised where practicable.

Tube stocks should be planted in a hole slightly longer than the root mass and potting mix. Soil should then be placed over the potting mix to prevent rapid drying after planting.

For weed control, anchored jute matting should be used around the seedling. Matting also helps to conserve soil moisture, improve water infiltration and soil structure, and moderate soil temperatures, thereby improving plant growth. Contact between the matting and the seedling should be avoided to minimise the risk of collar rot, although unlikely to occur at Broken Hill).

The use of tree guards is also recommended, as they protect against grazing by wildlife and pests such as rabbits and hares and provide protection from drying winds. Standard plastic sleeve guards held away from the seedling by three stakes would be utilised, where practical, to protect new plantings.

Landscape plantings would be enclosed within a stock proof fence where practicable to protect the new plantings from larger grazing herbivores including wildlife and livestock.

4.3 Planting Distances and Ratios

Four rows of planting would provide an adequate screen to the site. Three metre spacing for hand planted shrubs would generally produce a good result. The site specific conditions will be taken in to consideration at the time of planting to ensure that the desired screening coverage is attained.

4.4 Watering

Newly planted tube stocks would be watered-in to reduce planting shock, to remove air pockets next to roots and to help establish good root to soil contact. Follow up watering would be utilised only if extreme adverse weather conditions occur and threaten survival of the seedlings. Water supplied to the site for dust control (pipeline and on-site storage pond), could be used for landscape watering.

Additional watering may not be needed if adequate weed control, correct planting methods (no exposed potting mix) and normal rainfall occur. Rainfall and temperature data from the Broken Hill Airport AWS is provided in Table C01.

Table C01: Summary Statistics Broken Hill AWS (Site Number: 047048)

Statistic Element	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean maximum temperature (°C) for years 1957 to 2013	33.4	32	28.8	24.3	19	16	15.4	17.8	21.6	25.1	28.5	31.1	24.4
Mean number of days >= 40 °C for years 1957 to 2013	2.9	1.4	0.2	0	0	0	0	0	0	0	0.7	1.2	6.4
Mean minimum temperature (°C) for years 1957 to 2013	19	18.4	15.1	11.2	7.7	5.5	4.8	5.6	8.4	11.5	14.8	17	11.6
Mean rainfall (mm) for years 1947 to 2014	28.2	20.4	21.1	19.7	20.3	15.3	18.4	17.6	20.9	25.4	21.3	21.8	250.8
Mean number of days of rain >= 25 mm for years 1947 to 2014	0.3	0.1	0.1	0.1	0.1	0	0	0	0.1	0.1	0.1	0.2	1.2
Mean 9am temperature (°C) for years 1947 to 2010	24	22.9	20.2	17.5	13.3	10.1	9.5	11.6	14.8	17.9	20.7	22.7	17.1
Mean 3pm temperature (°C) for years 1947 to 2010	31.4	30.1	27.4	23.3	18.4	15.2	14.6	16.8	20.2	23.5	27	29.3	23.1

4.5 Performance Indicators

The purpose of the screening plants outlined in this Landscape Plan is to minimise the visual impacts of the solar PV power station from the Barrier Highway towards ‘The Pinnacles’.

The areas of landscape screening planting covered by this plan would be photographed from the following viewpoints (consistent with AGL/SKM (2012) Appendix C Visual Impact Assessment:

- Viewpoint 4 (assessed as high impact) – Barrier Highway # 4: located approximately 770 m to the north east of the solar PV power station site, adjacent to the Barrier Highway, elevated position with a clear view to ‘The Pinnacles’
- Viewpoints 17, 18 and 19 (assessed as medium impact) – located along the Silverton Road and Magazine Way.

The locations of the viewpoints are shown in Figure C02.

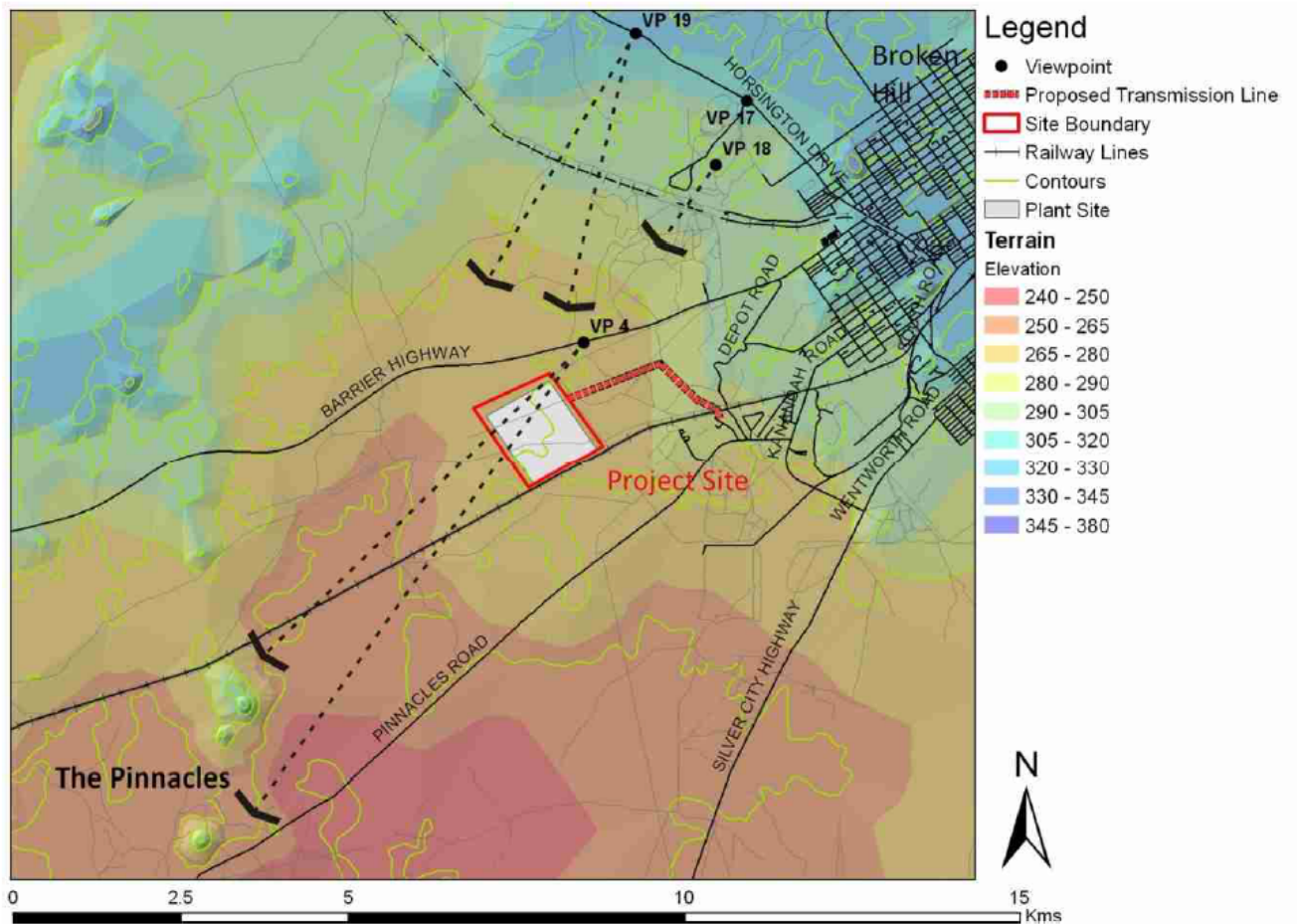


Figure C02: Location of Monitoring Viewpoints

Source: SKM (2012) *Broken Hill Solar Plant Environmental Assessment, Appendix C Visual Impact Assessment*

The solar PV power station would be photographed from these viewpoints at the time of planting and seasonally thereafter (by the owner/operator) and assessed in terms of visual impact on ‘The Pinnacles’. The goal is to integrate the proposed development into the landscape whilst maintaining views to ‘The Pinnacles’ from these viewpoints and therefore visual amenity.

The landscape planting will be monitored throughout the construction period. Replanting will be undertaken if the proportion of healthy shrubs is less than 80% or there are any obvious gaps in the vegetation screen as viewed from the specified viewpoints listed above.

4.6 Maintenance

This landscape plan covers maintenance requirements throughout the construction phase. If the landscaping is undertaken during the first month of construction, then the plantings will be approximately 15 months old at the time of handover to the owner/operator. Ongoing maintenance requirements should be addressed in the Operational Environmental Management Plan for the site.

Maintenance activities may include:

- Regular (e.g. weekly progressing to monthly) checks of fences to ensure stock do not gain access
- Monthly checks of tree guards to ensure they are correctly in place and /or undamaged. Tree guards should be removed when plants are well established and at a stage where the viability of the plant will not be compromised by animal pest activity
- Rainfall and soil moisture levels should be monitored for the first six months. Young plants should be watered if the soil becomes very dry or wilting is obvious. However, if the conditions are good at the time of planting additional watering can be minimised
- Monthly checks for weed competition. Spot spraying of weeds with selective herbicides may be required if weeds start to overpower seedlings but should be undertaken by a weed control contractor and in accordance with the Ground Cover Management Plan. The need for weed spraying will be minimised as far as practicable with pre-planting site preparation
- Monthly checks for evidence of wildlife browsing, such as by rabbits and kangaroos. Additional measures to prevent browsing should be employed. Measures may include wire cages or branches strategically placed around seedlings
- Unviable plants should be replaced as soon as practicable to ensure effective screening is attained, e.g. after the first autumn rains or in the following spring.

5. Long-Term Visual Impacts and Glare

- Access tracks would be constructed from locally sourced gravel that matches the colour of the existing site surface as far as practicable.
- The colour of above-ground ancillary electrical equipment associated with the solar PV plant would be selected to best integrate with the surrounding landscape, with preference given to earthy tones such as pale green and pale brown.
- Underground cabling would be used where possible.
- Vehicles would remain on designated paths during construction to avoid degradation of the landscape.
- Construction equipment and infrastructure would be demobilised from site as soon as practicable and all unnecessary project flagging and signage would be removed and disposed of at the completion of construction.
- In the event that glare from the solar plant is evident from a public road and causes a nuisance, distraction and/or hazard to motorists, the proponent shall immediately implement further glare mitigation measures.

6. Monitoring

Monitoring would be undertaken to ensure the establishment and ongoing maintenance of landscaped areas and to determine whether additional plantings are required. Monitoring would be undertaken on a fortnightly basis for the first six months after planting and monthly thereafter until the end of the construction phase (approximately a further 11-12 months).

The factors to be checked and recorded on Form-C01 are:

- Number of live and dead plants of each species
- Number of plants replaced
- Plant height (m)
- Plant condition – foliage, insect or vertebrate browsing, dieback
- Whether the tree guard is still present and its condition (replace faulty guards if necessary and record)
- The status of weeds; percentage of surface area covered, and whether each plant is subject to excessive competition or has outgrown the weed threat
- The moisture status of the soil; wet/moist/dry.

The results of photo monitoring from the three viewpoints nominated in Section 4.4 will be recorded on Visual Log Form-C02. Photographs should be taken seasonally to ensure a complete understanding of the success of the landscape plantings. Monitoring of shrub height (and selective removal of problem shrubs), could be a component of the operational management plan.

7. Community Consultation

The purpose of community consultation is to seek input and/or feedback from the interested community on proposed landscape measures. The AGL/SKM (2012) Environmental Assessment concluded that visual amenity impacts on residents would be unlikely. However, a consultation strategy on the proposed landscape measures will be developed as part of the Community Consultation Plan described in the CEMP and in accordance with AGL (2013) *AGL Community Consultation Plan Broken Hill and Nyngnan Solar Plants*.

Any community complaints or other feedback regarding visual amenity and landscaping will be recorded in accordance with First Solar's Complaints Management Procedure (refer to CEMP). Community consultation subsequent to the commencement of the operation of the solar farm will be the responsibility of the owner/operator (AGL).

Additional landscape plantings may be undertaken at strategic locations if required as a result of this community consultation. Any additional landscape plantings undertaken outside of the commitments within this Landscape Plan will be the responsibility of the owner/operator.



8. Responsibilities

8.1 Site Construction Manager

- Provide the resources required to implement this Landscape Plan or undertake any replanting required.

8.2 Site Environmental Advisor

The Site Environmental Advisor is primarily responsible for coordinating the landscaping works to be undertaken by a revegetation/landscaping contractor. These responsibilities are to:

- Coordinate, supervise and monitor landscape planting during construction (Form C01)
- Undertake visual monitoring and maintain records (Form-C02) during construction
- Provide information on this landscaping plan required for any community consultation undertaken during the construction phase.

At the conclusion of the construction activities (up to and including rehabilitation activities required of First Solar under the EPC Contract), the management of the operational site will be handed back to the AGL as the owner / operator of the site.

8.3 Supervisors

- Report any landscape planting losses to the Site Environmental Advisor.

8.4 Construction Personnel, Contractors and Sub-contractors

- Undertake landscape planting and maintenance.

9. Records

- Records of landscape planting inspections are maintained on Form – C01.
- Records of visual monitoring on Form– C02.

9.1 FORM-C01: Landscape Planting Monitoring Record

Date	Person	No. dead plants	No. plants replaced	Plant condition				Tree guards in place?	Corrective actions	Corrective actions complete	
				Height (m)	Overall health (good/poor)	Weeds (Y/N)	Soil moisture (wet/moist/dry)			Y/N	List



9.2 FORM-C02: Photo Viewpoint Record

Date	View Point	Photo File Reference	Assessment of Visual Amenity		Corrective Actions	Corrective Actions Completed	
			Gaps in landscape screening? (Y/N)	Clear view to 'The Pinnacles' (Y/N)		Person	Date
	4, 17, 18 or 19						



Sub-plan D – Construction Noise Management Plan



CEMP Sub-plan D – Construction Noise and Vibration Management Plan

1 Objectives

The objectives of this Construction Noise and Vibration Management Plan are to:

- Minimise potential construction noise and vibration impacts on sensitive receivers
- Guide construction methodologies to minimise noise and vibration levels
- Manage construction noise and potential impacts in accordance with the *Interim Construction Noise Guideline* (DECC, July 2009).

This plan addresses Project Approval Conditions: C3(d), B24, B25, B26 and B27.

This plan addresses commitments N1 to N5 of the SKM Submissions and Preferred Project Report (February 2013).

2 Construction Activities

2.1 Construction Noise Generating Activities

The potential noise generating activities associated with the construction phase of the Broken Hill Solar PV Power Station include:

- Noise from vehicles, plant and equipment (including generators)
- Traffic noise associated with the delivery of materials for construction, including:
 - Construction materials (e.g. crushed rock)
 - Portable buildings
 - Solar PV panels, tables, tilts and posts.
- Traffic noise generated during waste management activities onsite, including the delivery of skips and the removal of waste
- Noise from post installation
- General construction noise, including:
 - Installation of perimeter security fencing
 - Construction of access roads
 - Trenching, clear and grade, general civil works

- Construction of drainage channels
- Waste compacting.

2.2 Construction Scheduling

The construction period is expected to be 17 – 18 months, commencing in mid-2014 and finishing in late 2015.

An indicative schedule for construction works, including the potential noise generating activities listed in Section 2.1 is summarised in Table 1.

Table 1: Indicative Schedule for Construction Works

Construction Phase	Activity	Expected Duration
1. Mobilisation and Site Preparation	<ul style="list-style-type: none"> • Installation of temporary perimeter fencing. • Installation of construction water pond and pipeline. • Earthworks for access road and construction parking areas. • Vegetation clearing of site. • Construct temporary construction offices, laydown areas and vehicle/equipment maintenance areas. • Minor grading of areas for permanent site office and switchyard. • Installation of drainage channels across the site. 	2.5 months
2. Construction	<ul style="list-style-type: none"> • Install steel vertical support posts for array tables. • Install tilt brackets and modular racking tables. • Undertake trenching and wiring of underground cables. • Connect PV modules to the racking tables. • Install inverter and transformer skid. • Commence site rehabilitation works in power station development area. 	12 months
3. Commissioning	<ul style="list-style-type: none"> • Commission and test solar plant. 	2 months
4. Demobilisation	<ul style="list-style-type: none"> • Remove temporary construction facilities and rehabilitate temporary access tracks. • Complete works within the power station development. 	1 month

2.3 Construction Hours

Construction works are to be undertaken in accordance with the Broken Hill Project Approval Conditions.

Standard construction works will be undertaken within the timeframes outlined in Condition B24, as listed below:

- 7.00am to 6.00pm Mondays to Fridays, inclusive
- 8.00am to 1.00pm Saturdays
- Sundays and Public Holidays – no works.

Due to the nature of the development, some works associated with the commissioning of the solar PV panels need to be undertaken in darkness when the panels are not generating electricity. These works could include the installation of the PV panels. Works required to be undertaken outside the standard hours will be undertaken in accordance with Condition B25 and the *Interim Construction Noise Guideline* (OEH, 2009) and an Out of Hours Work (OOHW) Protocol.

In accordance with Condition B26, the noisiest activities will be scheduled to periods of the day / week where disruption to sensitive receivers is minimised as far as practicable. A project scheduler will be based on the site during construction works.

3 Construction Noise Assessment

3.1 General Construction Noise

A Construction Noise Assessment was undertaken by SKM as part of the Environmental Assessment (Vol. 6) for the Broken Hill Solar Plant (AGL 2012).

The assessment of nearby receivers found:

- One residential property located 1.3 km to the west of the project site on the Barrier Highway
- No other sensitive receptors located in the vicinity of the primary work site
- Numerous light industrial businesses located on the western outskirts of Broken Hill, approximately 1.5 km from the proposed solar PV plant, and within 1 km of the transmission line
- Residential areas of Broken Hill are located approximately 3.7 km to the north east of the solar PV plant site (see Table 2).

Table 2: Distances between the Solar Array and Nearest Receiver

Receiver	Distance -Solar Array (m)	Minimum Distance - Transmission Line (m)	Land-use
1 - Barrier Hwy (West)	1,300	2,750	Residential
2 - Barrier Hwy (East)	2,300	970	Residential
3 - Industrial Area	1,200	400	Industrial / Commercial
4 - Broken Hill Residential	3,700	1,900	Residential
5 - Pinnacles Road (East)	2,250	1,250	Residential
6 - Pinnacles Road (West)	1,800	1,000	Residential

The noise assessment also included prediction of likely construction noise levels. These predictions were assumed to be conservative because they did not consider the absorption of noise by local geography, structures or vegetation and it was assumed that all equipment and plant was operating at the same time, from a point nearest to the receptor. The predictions also assumed that all vehicle movements would occur during a one hour period (e.g. start and end of a day). The noise predictions therefore were considered to represent maximum levels. These results are shown in Table 3.

Table 3: Predicted Construction Noise Levels at Key Receivers

Receiver	Construction Noise Criteria LAeq dB(A)	Predicted Noise Level dB(A) LAeq		
		Stage 1 – Clearing	Stage 2 – Assembly	Stage 3 – Transmission Line
1 - Barrier Hwy (West)	40	39	34	22
2 - Barrier Hwy (East)	40	29	26	37
3 - Industrial Area	70	40	35	48
4 - Broken Hill Residential	40	21	17	28
5 - Pinnacles Road (East)	40	30	26	34
6 - Pinnacles Road (West)	40	34	29	37

3.2 Noise from Post Installation

A construction noise assessment was undertaken at the Nyngan Solar PV Power Station (after development approval) to further characterise the potential noise sources, in terms of noise level and impulsive noise (e.g. from post installation) (tonal noise is not expected to be significant component of the noise emissions from the site). The measurement of impulsive noise is defined in the NSW Industrial Noise Policy – noise has impulsive characteristics if the:

difference in A-weighted maximum noise levels between fast response and impulsive response is greater than 2dB.

This assessment was undertaken by SLR (2013) and reported in *Nyngan Solar Plant Construction Noise Assessment* (SLR Report). These results are relevant to the construction activities at Broken Hill and are discussed below.

The measured levels indicated that post driver emissions were not impulsive greater than 25 metres from the source.

SLR also undertook noise predictions of the potential noise levels from the post driver operations. This analysis found that post driver operations would comply with the 42 dBA LAeq NML (for the Nyngan site) for standard hours of operation where receivers are located at least:

- 1800 metres from nearest receivers with 3 post drivers in operation (unmitigated)
- 1600 metres from nearest receivers with 2 post drivers in operation (unmitigated)
- 1200 metres from nearest receivers with 1 post driver in operation (unmitigated)
- 700 metres from nearest receivers with 3 post drivers in operation (mitigated)
- 600 metres from nearest receivers with 2 post drivers in operation (mitigated)
- 450 metres from nearest receivers with 1 post driver in operation (mitigated).

Larger distances were required to comply with the 32 dBA LAeq NML (for the Nyngan site) for out of standard hours operation. Dependent upon the number of post drivers in simultaneous operation, noise mitigation was likely to be required where post installation works are undertaken 2400 to 3000 metres from the nearest residential receivers during out of hours.

The noise results imply that mitigation measures may be required for the nearest residence (Receiver 1) located 1.3 km from the site boundary for both standard and out-of-hours operations and Receivers 2,3,5 and 6 for out-of-hours. Mitigation measures would consultation and negotiation with identified receivers and control over the number of post drivers in operation at any one time. However, no intensive vibration activities will be undertaken during the construction phase of the power station.

3.3 Vibration

Construction activities have the potential to impact human comfort and the integrity of structures located in close proximity to works. In particular dynamic compaction, piling and hydraulic hammering generate high levels of vibration that may be transmitted to nearby receivers.

The nearest residential receiver to the construction area is located at a distance of approximately 1.3 km. However, no intensive vibration activities will be undertaken during the construction phase of the power station. Vibration monitoring can be undertaken in response to any complaints or concerns about these types of impacts.

.

4 Construction Noise Management and Mitigation Measures

4.1 General Safeguards

Noise controls should be observed, particularly where construction methodologies do not conform to the construction stages presented in Table 2 of this plan. Safeguards include:

- Restricting times when noisy work is carried out to standard construction hours
- Construction timetabling to minimise noise impacts - this may include time and duration restrictions and respite periods during noisy works, or the scheduling of noisy activities in consultation with nearby sensitive receivers
- The use of silencers and / or dampened tips on rock breakers if required
- Selection of plant and equipment based on noise emission levels
- Use of alternative construction methods where noise impacts are expected.

4.2 Vehicle, Plant and Equipment Noise Management

Vehicles, plant and equipment associated with the Broken Hill solar farm Construction Phase will be operated and maintained in accordance with manufacturer's instructions.

Construction vehicles, plant and equipment entering the Broken Hill solar farm site will be inspected upon arrival. The inspection will check each vehicle against the relevant manufacturer's specifications.

In addition, operators will be required to undertake a vehicle / plant / equipment inspections daily prior to use. Inspection sheets will be vehicle / plant / equipment specific and will be developed for each item of vehicle / plant / equipment from the manufacturers specifications for each item.

In the event that consultation with surrounding landowners identifies a compliance issue or issues are identified via the Complaints Management Protocol, First Solar will investigate the issue and implement mitigation where required. This may require the placement of a noise monitoring device at a receiver location to help tailor appropriate mitigation to address the compliance issue.

4.3 Post Driving

The mitigation measures to be implemented during post driving activities are:

- Maximum of one post driver to be operated within a radius of 500 metres of the western boundary, during standard construction hours, if other mitigation measures are not adopted
- Use of moveable noise barriers along the western boundary if more than one post driver is required within 500 metres of the western boundary, during standard construction hours
- Negotiated agreement with the nearest resident regarding post driving activities during both standard construction hours and out of hours (refer Section 4.4).

4.4 Out of Hours Work (OOHW) Protocol

Construction activities may be undertaken outside standard work hours in the following circumstances:

- Construction works generate noise that is no more than 5 dB(A) above the rating background level (RBL) of 30 dB(A) at the nearest residence
- No more than the noise management levels specified in Table 3 of the ICNG at other sensitive receptors
- For the delivery of materials outside those hours by the NSW Police Force or other authorities for safety reasons
- Where it is required in an emergency to avoid loss of life, property and/or prevent environmental harm
- For works approved through the out-of-hours work (OOHW) protocol.

This section describes the OOHW protocol for the management and approval of works outside of standard construction hours. The OOHW protocol covers work undertaken during the following periods (as defined by Condition B24) that have not been previously assessed (i.e. SKM 2012 Environmental Assessment), approved or agreed with the nearest residences:

- Hours prior to 7am Monday to Friday
- Hours post 6pm Monday to Friday
- Hours post 1pm Saturday
- Sundays and public holidays.

The OOHW protocol is described below:

- Construction Manager to provide a description of the activity and justification of varied work hours to the Site Environmental Advisor
- The Site Environmental Advisor is to determine whether the activity is expected to generate noise audible at the nearest receptor (i.e. greater than 35 dB(A))
- Construction Manager and Site Environmental Advisor to determine mitigation measures to be put in place and notify Project Manager
- The Project Manager to negotiate agreement with the potential noise receivers to proceed with works out-of-hours
- Site Environmental Advisor to seek approval from the Environmental Representative to proceed with works. Information to be provided will be task description, likely noise, noise monitoring to be undertaken, and whether any agreements had been reached with noise receivers.

5 Construction Noise Compliance Monitoring

First Solar will monitor onsite construction noise using a portable decibel meter. Noise monitoring will be undertaken:

1. Routinely at set periods during the week
2. During periods of intense construction activity (e.g. post driving – multiple drivers in operation or activity near the western boundary).

Monitoring (both routine and during periods of intense activity) will be undertaken at the key noise receivers described in Table 3.

Monitoring will be undertaken at noise receivers prior to commencement of construction (baseline monitoring) and during construction for comparison and assessment of actual noise impacts.

Monitoring would also be undertaken at noise receivers during post driving activities within 500 metres of the nearest receiver or in response to any noise complaints. Environmental Site Advisor to review post hole noise monitoring undertaken at Nyngan prior to implementing post hole noise monitoring program at Broken Hill. This CEMP may be updated on the basis of these findings.

Results from noise monitoring will be recorded on Form D01 (attached). Routine monitoring will be undertaken weekly (subject to onsite activity and weather conditions) at the above locations by the Site Environmental Advisor. Routine monitoring will be undertaken during periods of construction works (outside of break times) in the morning and/or in the afternoon.

The Site Environmental Advisor should record all noisy activities in a daily diary and corrective measures implemented to reduce this impact. These observations may be useful when responding to any noise complaints.

Where high acoustic readings are measured that may result in a noise nuisance at sensitive receivers (that is not in accordance with the Project Approval Conditions), the Site Environmental Advisor will notify the Site Construction Manager. Construction activities onsite will be assessed and scaled back (or staggered to avoid multiple sources of noise generation) if required to reduce the level of construction noise being generated from the site.

Meteorological predictions for the site will be monitored. Daily meteorological records are to be kept as part of the dust and air quality management plan.

The Site Environmental Advisor will advise the Construction Manager of any likely wind directions that may 'carry' noise to the three identified potential sensitive receiver locations. The area of Broken Hill experiences a desert climate, with cold, dry winters and generally hot and dry summers. Typical wind patterns show a predominance of north to north easterly winds throughout the year.

6 Construction Noise Impact Management

6.1 Community Consultation

Responsibility for Community Consultation remains with the Applicant (AGL) during the Construction Phase. First Solar has developed a First Solar Community Consultation Plan (refer to CEMP Sub-plan N) from the AGL *Community Consultation Plan Broken Hill and Broken Hill Solar Plants*.

First Solar will provide the following information to AGL for the purposes of informing community consultation:

- The proposed works
- The duration and nature of the works during construction
- What works are expected to be noisy
- What is being done to minimise noise
- When respite period would occur
- Regular updates on progress of works.

6.2 Complaints Management

- A complaints management procedure will be in place during construction. AGL will make this information available to the public in accordance with the requirements of the Project Approval.
- The process for the management of Complaints during the Construction Phase is set out in the First Solar Complaints Management Protocol described in the CEMP.
- Additionally, First Solar has developed a CEMP Auditing and Review Protocol to allow for amendments to be made to the CEMP (inclusive of the appendices). Where additional mitigation is identified or where mitigation measures are improved on site, these measures can be encapsulated within the CEMP using the auditing and review process.

7 Responsibilities

Site Project Manager

- Completion of Worker Environmental Awareness and Compliance Training
- Managing construction schedules to ensure compliance with noise requirements for construction works undertaken outside of standard work hours (Condition B23)
- Attendance at key stakeholder meetings (as requested by AGL) (refer to CEMP-R Community Consultation Plan)
- Attendance at community meetings (as requested by AGL) (refer to CEMP-R Community Consultation Plan)
- Providing AGL with project information requested in accordance with the Development Consent

Site Construction Manager

- Completion of Worker Environmental Awareness and Compliance Training
- Managing construction schedules to ensure compliance with noise requirements for construction works undertaken outside of standard work hours (Condition B23)
- Ensure mitigation measures outlined in the Construction Noise Management Plan are implemented as required.
- Advising the Project Manager and Site Environmental Advisor of upcoming activities that may require community consultation
- Managing construction noise and construction works in a manner to reduce noise generated
- Implement additional construction noise control measures where required
- Attendance at key stakeholder meetings (as requested by AGL) (refer to CEMP-R Community Consultation Plan)
- Attendance at community meetings (as requested by AGL) (refer to CEMP-R Community Consultation Plan)

Site Environmental Advisor

- Completion of Worker Environmental Awareness and Compliance Training
- Ensure mitigation measures outlined in the Construction Noise Management Plan are implemented as required.
- Undertake periodic noise measurements throughout the construction phase and record on Form-L01.
- Complaints Management in accordance with the responsibilities outlined in CEMP-Q Incident Management Protocol
- Attendance at key stakeholder meetings (as requested by AGL) (refer to CEMP-R Community Consultation Plan)
- Attendance at community meetings (as requested by AGL) (refer to CEMP-R Community Consultation Plan)

Site Supervisors

- Completion of Worker Environmental Awareness and Compliance Training
- Managing construction noise and construction works in a manner to reduce noise generated
- Ensuring that noise mitigation is in place prior to the commencement of noise generating activities
- Advising Construction Manager of noise generating activities ahead of the commencement of works

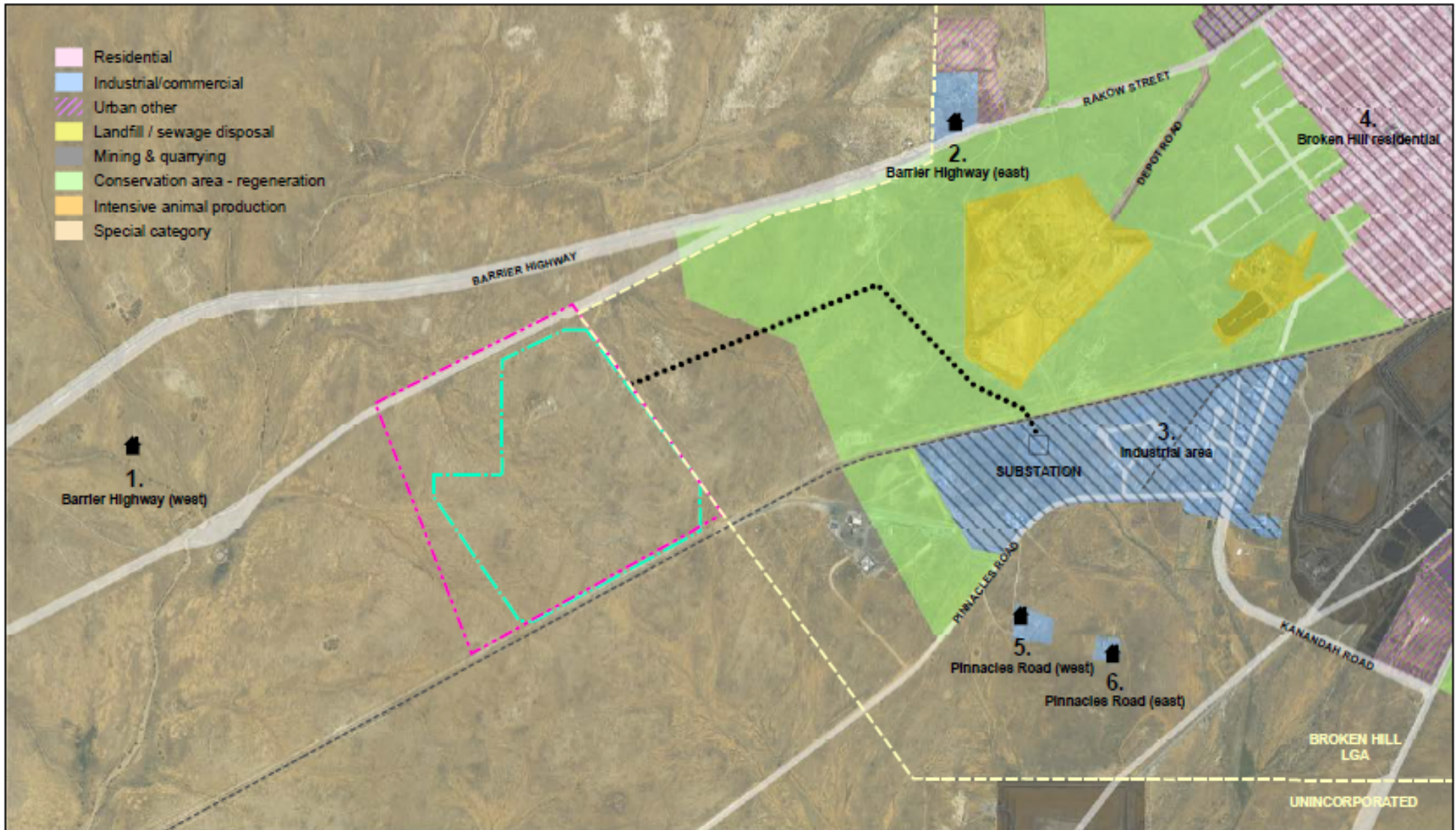
Site Personnel

- Completion of Worker Environmental Awareness and Compliance Training
- Manage noise generated from their work in a manner that reduces noise generated
- Ensuring that noise mitigation is in place prior to the commencement of noise generating activities
- Daily vehicle / machinery / plant inspections
- Advising Supervisors of noise generating activities ahead of the commencement of works

8 Records

- Noise measurements shall be recorded on Form D01 (attached).
- Noise complaints and corrective actions shall be recorded on the Complaints Record Form P02.

Figure 1: Area map and proximate receivers



- Site boundary
- Solar plant boundary
- LGA boundary
- Residential receiver
- Receiver area
- Railway
- Proposed transmission line easement



GDA 1994 | MGA Zone 54



■ Figure 1 Site layout and sensitive receivers

Sub-plan E – Construction Traffic Management Plan





Construction Traffic Management Plan Broken Hill Solar PV Power Station



Table of Contents

1	Purpose	5
2	Scope.....	5
	2.1 Overview.....	5
	2.2 Broken Hill Solar PV Power Station Development	5
	2.3 Relevant Approval Conditions	6
3	Plan Development Background.....	9
	3.1 Project Background	9
	3.2 Access Roads to Site	9
	3.2.1 <i>Barrier Highway</i>	11
	3.2.2 <i>Silver City Highway</i>	13
	3.3 Site Access	14
	3.4 Traffic Data	15
	3.4.1 <i>Existing Traffic Volumes</i>	15
	3.4.2 <i>Description of Construction Traffic</i>	16
	3.4.3 <i>Traffic Volumes Generated by the Construction Activities</i>	16
4	Construction Traffic Management Measures	21
	4.1 Management and Coordination of Vehicles	24
	4.1.1 <i>Employee Transportation</i>	24
	4.1.2 <i>School Bus Services</i>	25
	4.1.3 <i>Vehicle Logistics and Coordination at Site</i>	25
	4.1.4 <i>Logistics of Site Deliveries</i>	26
	4.2 Driver Code of Conduct and Site Inductions.....	26
	4.2.1 <i>Requirements Prior to Accessing the Site</i>	27
	4.2.2 <i>General Requirements</i>	27
	4.3 Statutory Responsibilities	28
	4.3.1 <i>Roads Act 1993</i>	28
	4.3.2 <i>State Environmental Planning Policy (Infrastructure) 2007</i>	28



4.4	General Measures to Minimise Interactions	29
4.4.1	<i>Access Intersection Upgrades</i>	29
4.4.2	<i>Livestock Safety</i>	31
4.4.3	<i>Speed Limits</i>	31
4.4.4	<i>Restricted Vehicle Access</i>	32
4.5	Traffic Management Plan Implementation	32
4.5.1	<i>Roles and Responsibilities</i>	32
4.5.2	<i>Traffic Management Plan Audit and Review</i>	33
4.5.3	<i>Competence Training and Awareness</i>	33



Document Control

Doc Rev	Date	Reason	Issued by	Review	Review	Review	Review
A	15/01/14	Issued for FS review	Beca	SF	21/01/14		
B	22/01/14	Issued of AGL review and technical input	First Solar				
C	24/02/14	Issued including AGL review comments	Beca				
D	6/03/14	Issued including AGL final comments on intersection	Beca				
E	30/06/14	Issue to First Solar including RMS comments	Beca				
F	26/9/14	RMS correspondence & acceptance appended	First Solar	TG	26/9/24		



1 Purpose

This Construction Traffic Management Plan for the Broken Hill Solar PV Power Station has been prepared to meet the requirements of:

- The Broken Hill Solar PV Power Station Project Approval (MP10-0202)
 - Condition C3(e)
- Broken Hill Solar Plant Submissions and Preferred Project Report (SKM, February 2013)
 - Commitment TT1
 - Commitment TT3

2 Scope

2.1 Overview

As required by Project Approval (MP10-0202) for the Broken Hill Solar PV Power Station, First Solar (Australia) Pty Ltd (First Solar) has developed the following Traffic Management Plan for the development as it relates to the activities of First Solar. Specifically this Traffic Management Plan relates to the Construction Phase for the power station.

A second CEMP is being prepared for the power station's grid connection by a separate contractor. The grid connection for the Broken Hill Solar PV Power Station is not under the mandate of First Solar (Australia) Pty Ltd (First Solar) and is therefore not included within the following document. Please refer to the separate grid connection / transmission line CEMP for information specific to the grid connection construction works.

By agreement with First Solar, the requirements of Condition B31 and Commitment TT2 are being separately managed by the Proponent (AGL). Information on the Barrier Highway upgrades is not included within the following report First Solar Construction Traffic Management Plan.

The Pre-Construction Road Report and Road Dilapidation Reports required by Condition B30 (a) and B30 (b) and Commitment TT4 are being separately prepared and are not included within this report.

On-site traffic movements will be managed in accordance with the First Solar *Vehicle Movement Plan* (which forms part of the First Solar *Project Site Safety Plan*) and is not included within this report.

2.2 Broken Hill Solar PV Power Station Development

The Broken Hill Solar PV Power Station will consist of a 53MW solar PV power station located approximately 5km south-west of Broken Hill. The solar plant will occupy approximately 140



hectares of land bounded to the north by the Barrier Highway and the Peterborough-Broken Hill rail line to the south.

First Solar (Australia) Pty Ltd have been engaged by AGL to provide engineering, procurement and construction (EPC) services. The Broken Hill Solar PV Power Station will utilise First Solar’s advanced cadmium telluride (CdTe) thin film photovoltaic modules. The solar modules generate electricity with no air emissions, no waste production, no water use and have one of the smallest carbon footprints of any current PV technology. Over 7,000MW of First Solar PV modules have been installed worldwide, including at many of the world’s largest solar PV plants, since beginning commercial production in 2002. First Solar has been actively involved in the Australian market since mid-2008.

The construction of the Broken Hill Solar PV Power Station project is expected to commence in early July 2014 and will take approximately 15 months to complete.

2.3 Relevant Approval Conditions

The approval provisions for the Broken Hill Solar PV Power Station relevant to the Construction Traffic Management Plan are as follows:

Project Approval Conditions:	Document Reference:
<p>C3(e) A Traffic Management Plan to manage traffic conflicts that may be generated during construction in preparing the plan, the Proponent shall consult with the Council, RMS and the Crown Lands Division of the Department of Trade and Investment. The Plan shall address the requirements of the relevant road authority and shall include, but not necessarily be limited to:</p>	
<ul style="list-style-type: none"> • details of how construction of the project will be managed in proximity to local and regional roads; 	<p>Section 4.1</p>
<ul style="list-style-type: none"> • details of traffic routes for heavy vehicles, including any necessary route or timing restriction for oversized loads; 	<p>Section 3.2 Section 4.4.4</p>



<ul style="list-style-type: none"> demonstration that all statutory responsibilities with regard to road traffic impacts have been complied with; 	Section 4.3
<ul style="list-style-type: none"> details of measures to minimise interactions between the project and other users of the roads such as the use of fencing, lights, barriers, traffic diversions etc.; 	Section 4.4
<ul style="list-style-type: none"> procedures for informing the public where any road access will be restricted as a result of the project; 	Section 4.4.4
<ul style="list-style-type: none"> procedures to manage construction traffic to ensure the safety of livestock and to minimise disruption to livestock; 	Section 4.4.2
<ul style="list-style-type: none"> speed limits to be observed along routes to and from the site and within the site; and 	Section 4.2 Section 4.4.3
<ul style="list-style-type: none"> details of the expected behavioural requirements for vehicles drivers travelling to and from the site and within the site. 	Section 4.2.4
Submission Report Commitments:	Document Reference:
TT1 The proponent or its contractor will determine the final details of haulage during detailed transport planning, in consultation with RMS. Road and intersection works will be approved and completed prior to the commencement of construction of the solar plant, and will be at no cost to RMS.	This CTMP forms the start of the consultation with RMS on these proposed routes.
TT3 A Traffic Management Plan will be prepared and implemented for the construction, operation and decommissioning phases of the project. The plan will specify:	The First Solar Traffic Management Plan has been developed to meet the requirements of the commitment with respect to construction. The operational and decommissioning phases are not encapsulated within this Construction



	Traffic Management Plan as it is outside of First Solar scope as the EPC contractor.
<ul style="list-style-type: none"> Travel routes and parking areas for construction and operations traffic. 	<p>Section 3.2</p> <p>Section 4.1.1</p>
<ul style="list-style-type: none"> Origin, number, size and frequency of vehicles accessing / exiting the site. 	<p>Section 3.4.2</p> <p>Section 3.4.3</p>
<ul style="list-style-type: none"> Speed limits and directions of travel on the access roads within the site. 	<p>Section 4.4.3</p> <p>(covered in separate First Solar Vehicle Management Plan (VMP))</p>
<ul style="list-style-type: none"> Loads, weights and lengths of haulage and construction related vehicles. 	<p>Section 3.4.2</p>
<ul style="list-style-type: none"> Scheduling of haulage vehicle movements to minimise convoy lengths and platoons. 	<p>Section 4.1.4</p>
<ul style="list-style-type: none"> Traffic control requirements, including requirements for signage, barriers and traffic control personnel. 	<p>Section 4.4</p>
<ul style="list-style-type: none"> The management and co-ordination of vehicle movements to the site and measures to limit disruption to other motorists, emergency vehicles and school bus timetables. 	<p>Section 4.1</p>
<ul style="list-style-type: none"> Details of intersection improvement works in accordance with Austroads Guide to Road Design 2010 and RMS supplements. 	<p>Section 4.4.1</p>



3 Plan Development Background

To meet the requirements of Condition C3(e) and Commitment TT3, First Solar engaged Beca Pty Ltd (Beca), an independent suitably qualified consultancy, to develop a Construction Traffic Management Plan.

The following Construction Traffic Management Plan relates specifically to the power station construction and the activities of First Solar.

3.1 Project Background

The project site is in the far western area of New South Wales (NSW). The site is situated approximately five kilometres south west of the Broken Hill city. The proposed plant site is on Crown Land and located within an unincorporated area which is administered by the NSW Department of Primary Industries, Catchments and Lands Division. The land parcel is completely within Lot 6806 Plan 823918 and is located between Barrier Highway to the north and Peterborough-Broken Hill rail line to the south of the site as shown in **Attachment 1**.

As outlined in the Environmental Impact Statement (EIS), the overall development programme for this project is as follows:

- Construction – mid 2014 to late 2015
- Commissioning – 2015
- Operation - 2016 to 2045
- Decommissioning – 2045 onwards

It is anticipated that the overall construction period will be approximately 15 months with the operation period of up 30 years.

3.2 Access Roads to Site

During the construction of the Broken Hill Solar PV Power Station, First Solar is anticipating deliveries from the following locations:

1. Adelaide
2. Newcastle / Sydney
3. Melbourne

This section describes the key access routes that will be utilised when transporting construction materials, equipment and employees to the power station site from these locations.



3.2.1 Broken Hill Township

The proposed routes through Broken Hill Township are as follows.

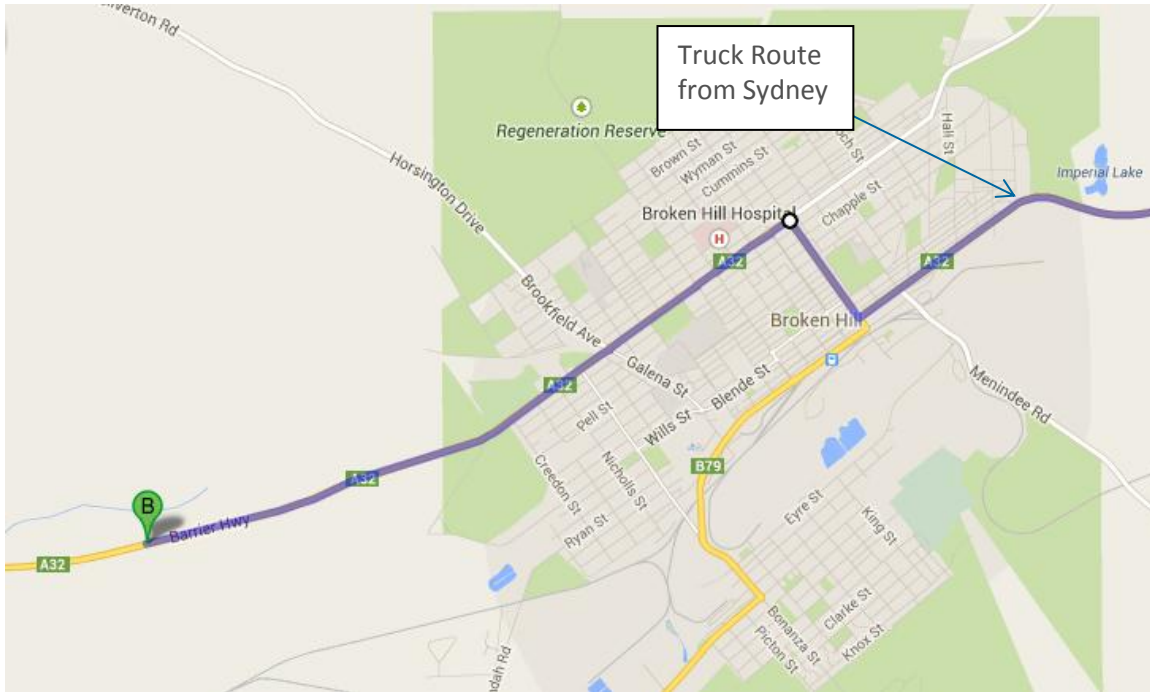


Figure 1- Truck Route from Sydney.



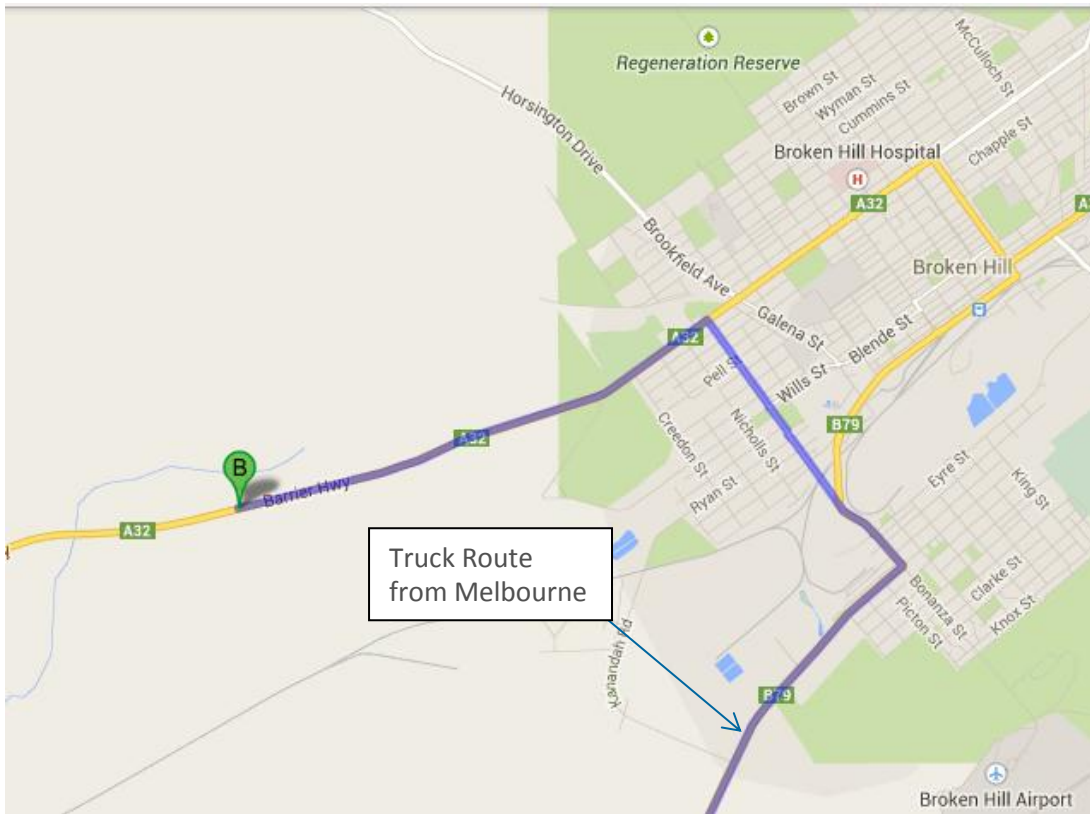


Figure 2- Truck route from Melbourne.

3.2.2 Barrier Highway

Barrier Highway (National Route A32) is an important route connecting South Australia to the mid area of NSW. Barrier Highway is a dual lane, bi-directional highway with sealed shoulder in most areas. The posted speed limit at the location of the site access is 110km/hr. Barrier Highway will be utilised from either direction, i.e. to/ from Adelaide (west) and to/ from Broken Hill (east).



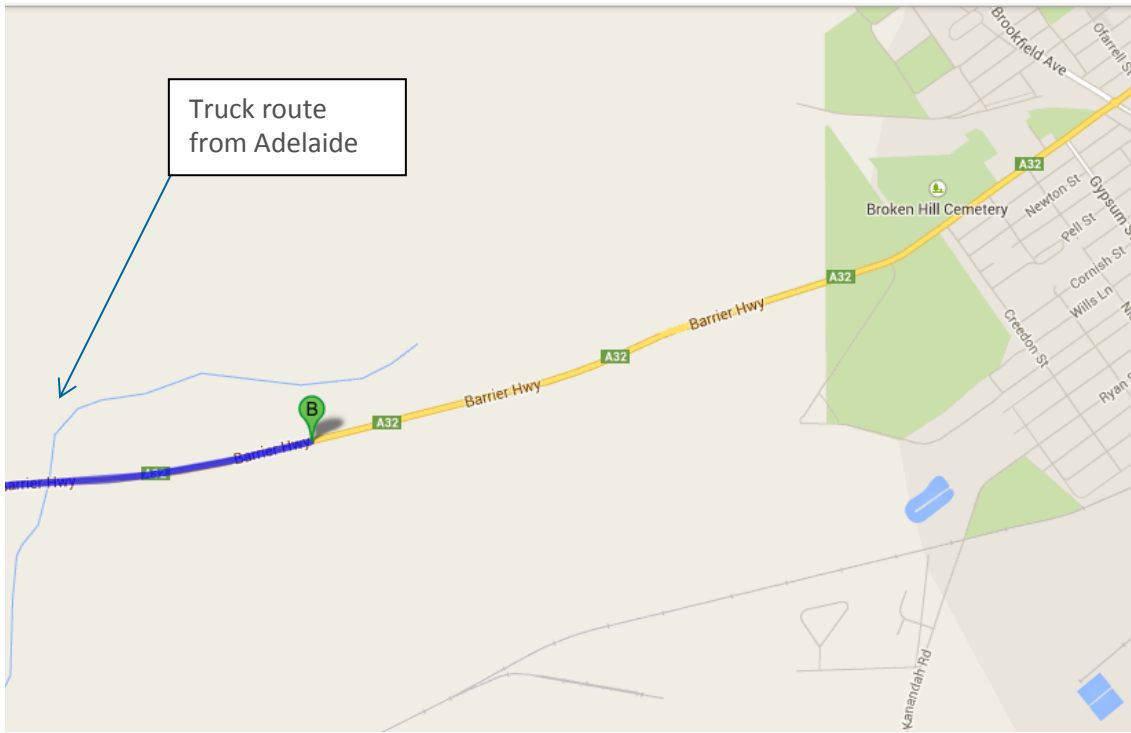


Figure 3 Truck route from Adelaide.



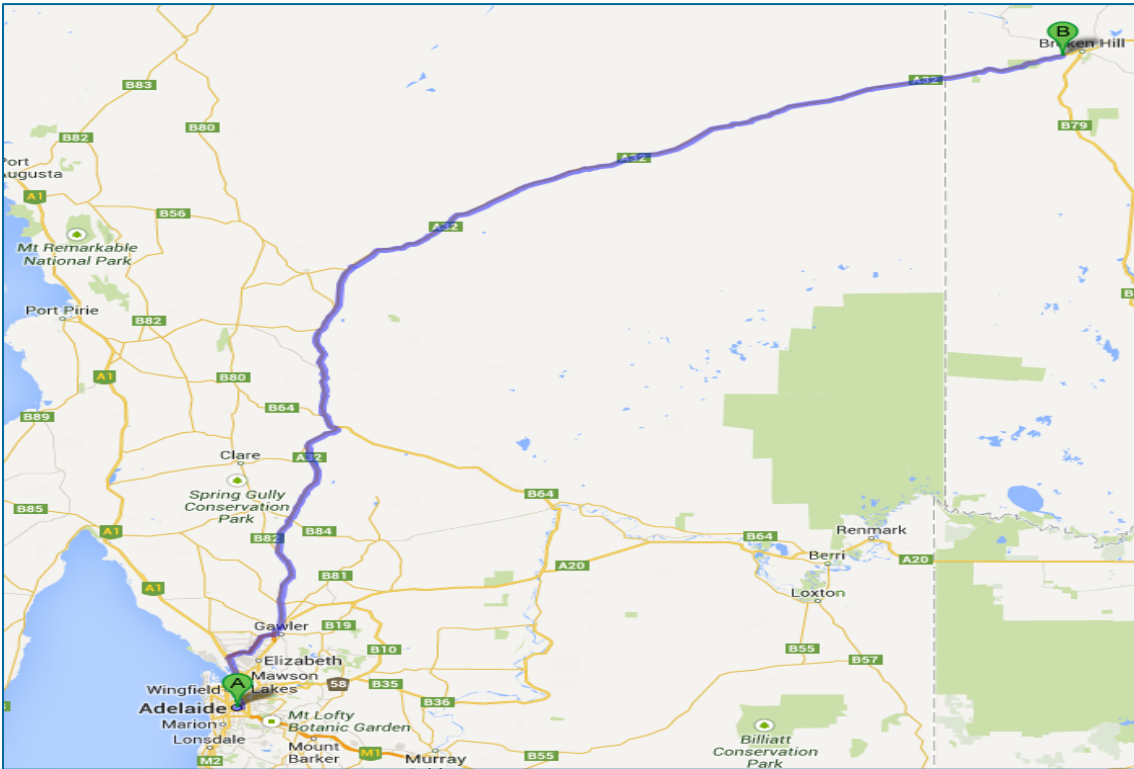


Figure 4 Barrier Highway route Adelaide west to Broken Hill

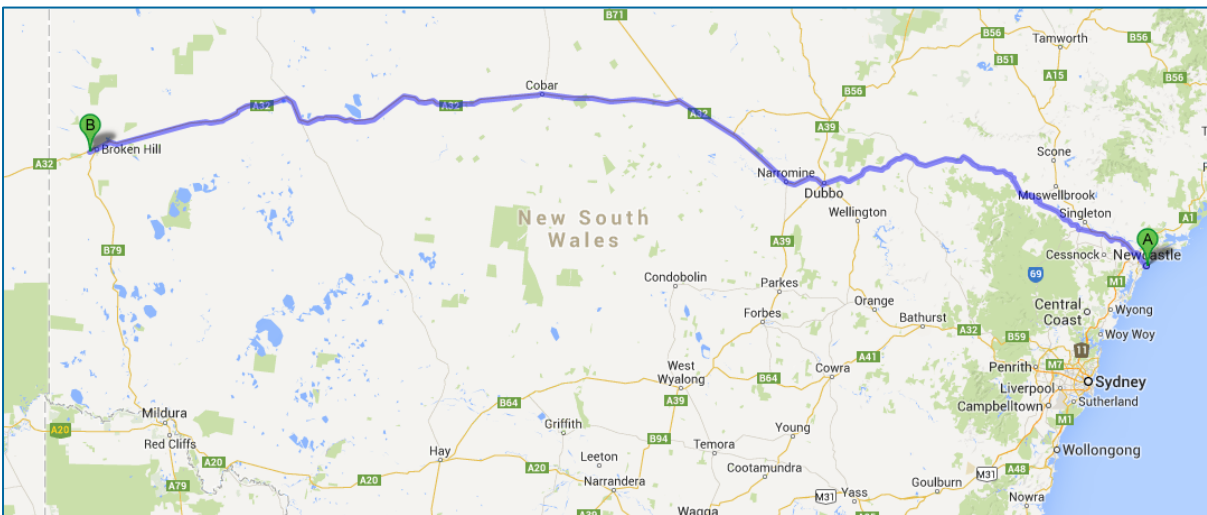


Figure 5 Barrier Highway route east to Broken Hill from Newcastle

3.2.3 Silver City Highway

Silver City Highway (B79) is also an important route connecting Melbourne and surrounding area to Broken Hill (via Mildura). This state highway is a sealed dual lane, bi-directional highway that serves inter/ intra-regional state journeys.



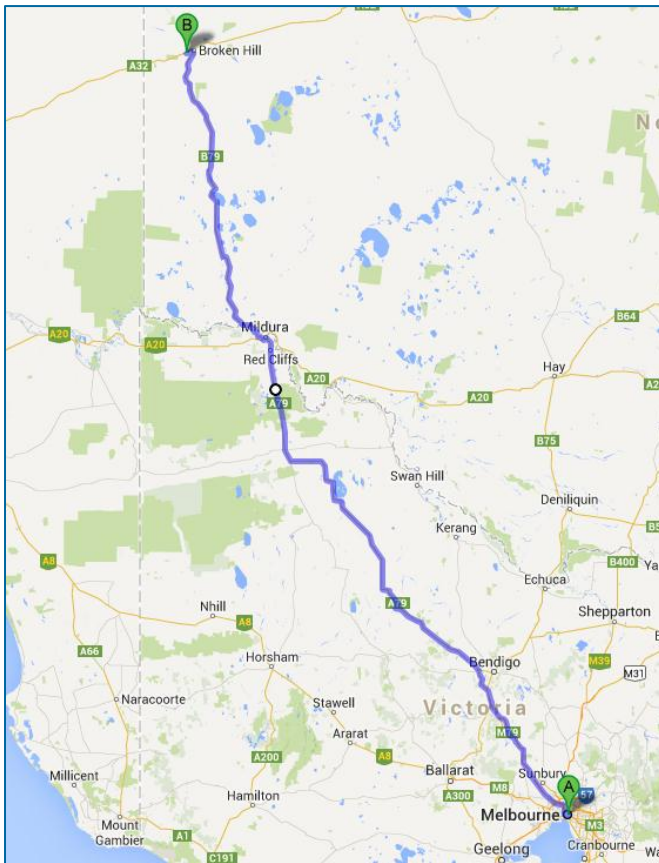


Figure 6 Silver City Highway route from Melbourne to Broken Hill

3.3 Site Access

The proposed site access to the Broken Hill Solar PV Power Station site is an existing unsealed access off the southern side of the Barrier Highway south west of Broken Hill city. This access road is eight metres wide and is a non-formalised access. The access road is in a suitable condition for use by construction traffic, including light vehicles. Some upgrade works are recommended for the site access intersection with the Barrier Highway. This is discussed further in Section 4.4.1. The access currently serves the existing lessee and will continue to do so during the construction and operational period of the solar plant.

Internal onsite access tracks will be created by First Solar during the initial site enabling works to cater for the movements within the construction site. The internal access tracks will include both operational access tracks and access tracks required just for the construction period. As identified in Section 2.1, internal site access tracks are outside of the scope of the Construction Traffic Management Plan which relates only to the management of construction traffic on public roads.



3.4 Traffic Data

This section discusses the existing traffic data for the public roads (routes as identified in Section 3.2) and the proposed construction traffic data required for the construction of the Broken Hill Solar PV Solar Power Station. The data below includes the vehicle types and peak periods for the construction of the power station.

3.4.1 Existing Traffic Volumes

The existing traffic flows for the public roads that are expected to be utilised during the construction of the power station, have been obtained from the NSW Roads and Maritime Services (RMS). Traffic volumes for the proposed access road (as identified in Section 3.3) have been obtained from the existing lessee of the Western Lands lease.

Table 1: Existing Traffic Volumes

Traffic Counter Location	Combined (Two-way) Traffic Flows		
	AADT	AM Peak (8-9am)	PM Peak (5-6pm)
Barrier Highway, East of Broken Hill	886	47	50
Silver City Highway, South of Broken Hill	388	24	24
Barrier Highway, West of Gypsum Street, Broken Hill	2,002	141	139
Barrier Highway, 12.8km West of Broken Hill ¹	1209	68 ²	77 ²
Proposed Access Road	16	0	0

As shown above, both the existing daily and peak hour traffic volumes on the respective highways in the vicinity of the site are very low, being more akin to local road traffic volumes. The low traffic volumes recorded are due to the proposed location of the site and surrounding land use context. The traffic volumes from the proposed access road (16 vehicles) have not been included in the analysis as the vehicles are expected to be leaving from the access road in the morning peak rather than arriving to site.

¹ Station ID 98079, SH8 (Barrier Hwy), Broken Hill – 12.8km west of Post Office – 2010-2011 Data,

² The actual peak period at this location is between 9-10am (85 vehicles) and 3-4pm (86 vehicles) during the weekdays.



3.4.2 Description of Construction Traffic

The current First Solar development program for the Broken Hill project has construction scheduled to commence in July 2014 and completion in September 2015.

First Solar will be undertaking construction works in accordance with the standard construction hours outlined in Condition B24 of the Project Approval, specifically:

- Monday to Friday – 7:00am to 6:00pm
- Saturday and Sunday – 8:00am to 1:00pm

Works outside of the standard construction hours are provided for under Condition B25 of the Project Approval. First Solar will be undertaking works seven days per week. Works outside of the standard construction hours will be undertaken in accordance with both Condition B25 of the Project Approval and the requirements of CEMP-L *Construction Noise Management Plan*.

Construction traffic (including light vehicles) will be operating seven days per week.

The construction traffic would typically consist following types of vehicle movements:

- **Light Vehicles** – Project and personal vehicles would be used to commute to and from the construction site and accommodations in Broken Hill city.
- **Light Service Trucks** – The service truck dimensions are 8.8m in length and 2.5m in width. The trucks would transport construction material and equipment sourced locally from Broken Hill city or townships nearby.
- **Standard Articulated Trucks** – The truck dimensions are 19m in length and 2.5m in width. These trucks are expected to transport construction equipment and materials such as posts, tilts, electrical & cables, shelters, inverters and xformers. The origin of this equipment and materials would be from Adelaide, Melbourne/ Geelong, Sydney/ Dubbo and or Brisbane sites.
- **Oversize Vehicles** – A number of oversize and overweight vehicles will be used for the delivery of major plant and infrastructure of this project. It is expected that these vehicles will be transport from the Adelaide Port.

All vehicle dimensions are in accordance with Austroads Design Vehicles, 2006.

3.4.3 Traffic Volumes Generated by the Construction Activities

The general construction labourers would primarily be employed from the Broken Hill city area or within nearby townships. These general construction labourers would generally consist of construction workers and electricians (where a specialist electrical sub-contractor is not engaged by First Solar). Personnel for specialist roles that cannot be filled locally, personnel would be flown to Broken Hill city airport for either a 21 / 7 or a 10 / 4 roster.

First Solar anticipates that all personnel that cannot be sourced locally can be accommodated in Broken Hill city with the existing accommodation facilities.



Provision has been made within this plan for the use of private light vehicles from Broken Hill City or nearby towns. The number of private light vehicles will be subject to the engagement of locally based construction personnel (this number has not yet been determined).

It is expected that there will be a maximum of 120 employees working on site at the peak of construction. The traffic volumes accessing site have been based on three employees per vehicle i.e. 40 vehicles accessing site. The traffic volumes expected to be generated by the various construction activities throughout the 15 month period are summarised in the following table. The peak hourly traffic volumes are expected daily between 6:00am – 7:00am and 5:00pm – 6:00pm.

To reduce the number of private vehicles accessing the site and to reduce the impact on the local network, carpooling will be encouraged for construction personnel as a form of commute.

First Solar will encourage staff to car pool through use of two-way communication, as a process for making sure safety communications are delivered to employees with the capacity for feedback to be provided, reviewed and escalated where appropriate to encourage carpooling.

As carpooling is an arrangement by two or more commuters to drive to or from work together from their place of residence or a prearranged meeting point First Solar will determine interest through a travel survey or consultation meeting to gauge the needs and current travel behaviours of project staff. Feedback received will be used to set guidelines and create incentives to further encourage participation. Inductions, posters, toolbox meetings, and daily pre-starts, are examples of tools that will be utilized to communicate carpooling activities within Broken Hill.

Overall people will be matched by suburb/route to aid with the reduction of traffic on roads, we will also introduce a guaranteed ride policy and reward monitoring scheme so that the carpooling program is successful.



Table 2: Expected Construction Phase Traffic Generation

Type	Origin	Size / Type of Vehicle	Frequency (per day)	Total No. of Trucks
Materials				
Modules	Adelaide	79t, 36.5m Road Train	0.83vpd/1.66vmpd	150
Posts	Melbourne / Geelong	42.5t max <19m	0.17vpd/0.33vmpd	30
Tilts	Melbourne	42.5t mx <19m	0.05vpd/0.1vmpd	9
Tables	Adelaide	79t, 36.5m Road Train	0.5vpd/1vmpd	90
Electrical & Cables	Sydney	42.5t max <19m	0.28vpd/0.55vmpd	50
Shelters	Adelaide	42.5t max <19m	0.23vpd/0.47vmpd	42
Inverters				
Transformers				
PVCS/PVIS				4
Materials Total	Over 180 day period (arrive loaded & depart empty)		2.08vpd/4.16vmpd	375
Personnel to Site				
Private Staff Vehicles	Broken Hill and surrounding areas	Light vehicle with GVM <4.5t	40vpd/80vmpd	NA
Equipment				
Equipment	Sydney / Dubbo to site	42.5 max <19m	8vpd/16vmpd during 10 day mobilisation and de-mobilisation period	NA
Peak Daily Movements Based on the sum of Materials Deliveries (8.3), Employees and Staff (80) and Construction Equipment (16) for 180 day period (including mobilisation and de-mobilisation periods)				101.0 vpm
Peak Hourly Movements Based on 40vpd for Light Vehicles during the peak hours (6-7am and 5-6pm)				40 vph

Source: First Solar

* vpd – Vehicles per day, vmpd – Vehicle movements per day, vph – Vehicles per hour



The following table outlines the Peak Daily Movements to site, including Direction of Travel from Origin.

Table 3: Peak Daily Movements to Site (including Origin)

Origin	Size/Type of Vehicle	Heading to Site (Turn in)	Frequency (per day)
Peak Daily Movements			
Adelaide	79t, 36.5 road	Eastbound (Right)	1.33vpd / 2.66vmpd
Adelaide	4.25t max <19m	Eastbound (Right)	0.25vpd/0.51vmpd
Total (Eastbound)			2vpd/4vmpd
Melbourne / Geelong	42.5t max <19m	Westbound (Left)	0.22vpd/0.43vmpd
Sydney	42.5t max <19m	Westbound (Left)	0.28vpd/0.55vmpd
Broken Hill and surrounding areas	Light vehicle with GVM <4.5t	Westbound (Left)	40vpd/80vmpd
Sydney / Dubbo to site (10 day mobilisation and demobilization periods)	42.5t max <19m	Westbound (Left)	8vpd / 16vmpd
Total (Westbound)			48.5vpd / 97vmpd
TOTAL NUMBER OF VEHICLE MOVEMENTS			101vmpd

Source: First Solar

* All movements heading out of site will be in the opposite direction

The total anticipated traffic generated by the site will be 40 vehicles per peak hour (morning and afternoon respectively) during the peak construction periods for the project. The only construction traffic expected to be on the public road network in the vicinity of the site in the 6:00am – 7:00am peak period would be the light vehicles from employees commuting to the construction site. During the 5:00pm – 6:00pm peak hour the majority of this traffic will be the reverse of the morning traffic and include primarily eastbound vehicles heading for the Broken Hill city area. The AM peak period does not align with the general business peak period (8-9am). The traffic data obtained along Barrier Highway (12.8km west of Broken Hill) indicate that the peak period is between 3-4pm. This does not align with the peak period anticipated from the construction works. Therefore, the overall effect with the additional traffic volumes generated along Barrier Highway, Broken Hill would be no more than minor

As the project schedule progresses the number of logistical deliveries and onsite personnel required for undertaking the construction works will decrease.



The project construction program commences in July 2014 with a projected completion of September 2015. It is anticipated that the approximate number of construction days are 460 (with the assumption that the site is operational for seven working days per week).

The total expected traffic generation, by vehicle size, is detailed in the following table.

Table 4: Total construction traffic generation by vehicle size

Vehicle Type:	Total Movements:
79t, 36.5m Road Train	479
42.5t max <19m	509
Personal light vehicles	36,800
Company Light Vehicle	18,400
TOTAL:	56,188

The draft First Solar schedule for the material delivery is as follows:

- August 2014 to May 2015 – Posts, Tilts, Tables, Construction equipment, Electrical& Cable and PVCS/PVIS
- January 2015 to June 2015 – Solar PV Modules
- January 2015 to June 2015 – Inverters, transformers and shelters

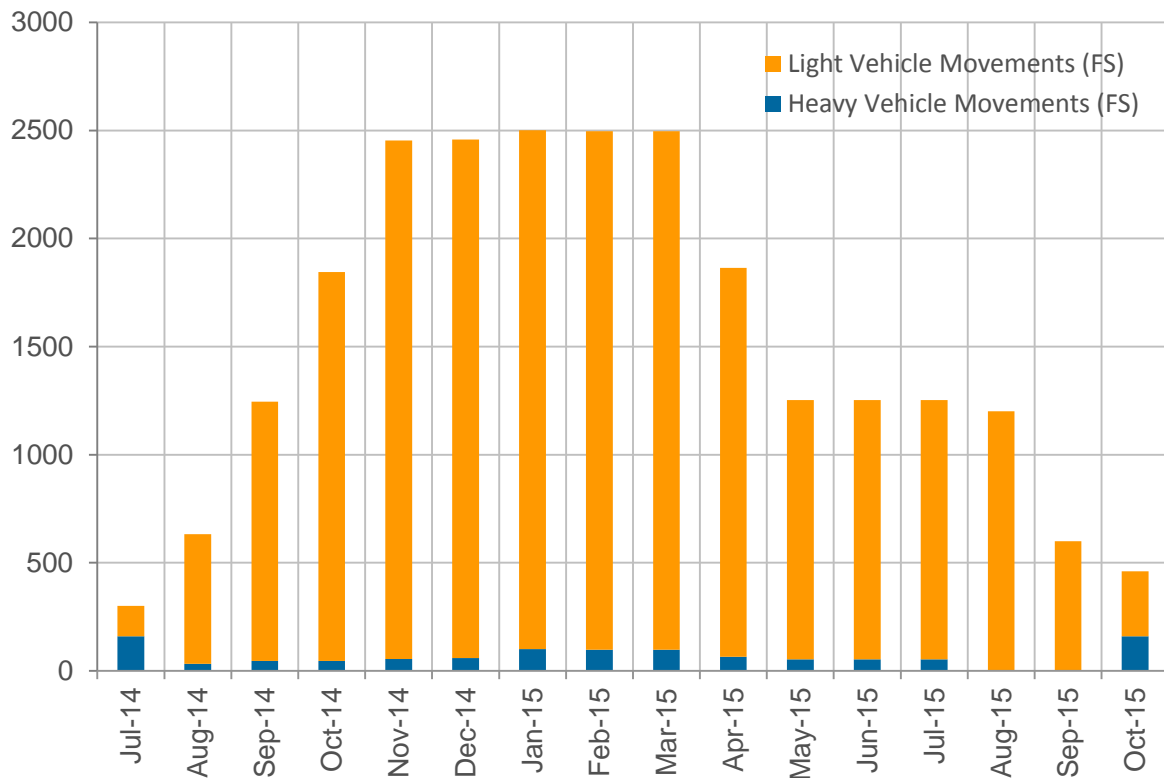


3.4.4 Monthly Traffic Flow Profile

This section contains data for the estimated monthly traffic flow profile for Broken Hill. The basis of this data is as follows:

1. Total number of vehicles is based on the data presented in the First Solar TMP for:
 - a. Materials quantities
 - b. 10 day mobilisation/de-mobilisation period of 8 vehicles per day
 - c. Maximum of 40 staff cars travelling to site per day
2. Monthly profile is based on the current construction schedule, including:
 - a. Delivery dates for equipment and materials
 - b. Expected mobilisation dates for subcontractors (electrical, structural, etc.)
 - c. First Solar mobilisation/de-mobilisation dates

A) CHART



B) CHART DATA – SUMMARY

	Heavy Vehicle Movements (FS)	Light Vehicle Movements (FS)	Total Vehicle Movements (FS)
Jul-14	160	140	300
Aug-14	32	600	632
Sep-14	45	1200	1245
Oct-14	45	1800	1845
Nov-14	54	2400	2454
Dec-14	58	2400	2458
Jan-15	101	2400	2501
Feb-15	97	2400	2497
Mar-15	97	2400	2497
Apr-15	65	1800	1865
May-15	52	1200	1252
Jun-15	52	1200	1252
Jul-15	52	1200	1252
Aug-15	0	1200	1200
Sep-15	0	600	600
Oct-15	160	300	460



C) CHART DATA – DETAIL

	Heavy Vehicle								Light Vehicle
	Construction equip.	Modules	Posts	Tilts	Tables	Elec & cable	PCS Skids	PVCS	Staff cars to site
Jul-14	80								5
Aug-14									10
Sep-14			3.8	1.1	11.25	6.3			20
Oct-14			3.8	1.1	11.25	6.3			30
Nov-14			3.8	1.1	11.25	6.3			40
Dec-14			3.8	1.1	11.25	6.3		2	40
Jan-15		21.4	3.8	1.1	11.25	6.3	4.7	2	40
Feb-15		21.4	3.8	1.1	11.25	6.3	4.7		40
Mar-15		21.4	3.8	1.1	11.25	6.3	4.7		40
Apr-15		21.4				6.3	4.7		30
May-15		21.4					4.7		20
Jun-15		21.4					4.7		20
Jul-15									20
Aug-15									20
Sep-15									10
Oct-15	80								5



4 Construction Traffic Management Measures

4.1 Management and Coordination of Vehicles

This section discusses First Solar's methods to manage and coordinate its construction vehicles and movements of construction personnel to identify methods of minimising the impact on the public road network.

A HAZID (hazard identification) study will be undertaken by First Solar during the development of the Project Site Safety Plan (PSSP). The purpose of the HAZID is to identify risks associated with use of vehicles either transporting construction personnel or construction materials (including plant and equipment). Once health and safety related risks are identified, appropriate risk mitigation measures will be put in place by the First Solar Health and Safety Team.

4.1.1 Employee Transportation

It is anticipated that majority of the employees will be employed from the Broken Hill city area and surrounding towns, where required expertise is available. Where certain expertise cannot be found within Broken Hill city, the workforce will be supplemented via a fly in-fly out (FIFO) arrangement via the Broken Hill Airport. Personnel will be employed on either a 21 / 7 or 10 / 4 roster. First Solar will meet its labour needs from the local community as far as practicable to minimise the FIFO process.

Employees not resident in Broken Hill city will be accommodated within Broken Hill city within the existing accommodation facilities available.

First Solar will manage the transportation of workers between Broken Hill city and the construction site to minimise the number of trips generated daily by the employees. As discussed in Section 3.4.2, the majority of the construction workforce will use project or private vehicles between Broken Hill City and surrounding townships to and from the construction site. The approximate schedule would be:

- From Broken Hill city to the site – 6:00am to 7:00am
- From the site to the construction site in Broken Hill - 5:00pm to 6:00pm
- To and from the Broken Hill Airport (in accordance with scheduled roster requirements)

First Solar will provide sufficient car park spaces within the site to accommodate for the staff and additional visitors on site. Alternative transport methods such as carpooling will be encouraged by First Solar to reduce the potential impact of additional trips within the Broken Hill City network and vehicles turning into and out of the site.

The traffic generated during the AM peak period will not coincide with the general business AM peak period (8-9am). During the PM peak period; this would be the same situation as the general business peak period would not coincide with the construction peak period. As the employee traffic



would be heading out of Broken Hill city this would be in the opposite direction of the general traffic, therefore, in general have a lower impact to the road network.

4.1.2 School Bus Services

The peak periods generated by construction traffic will be from the light vehicles which will be during 6-7am and 5-6pm.

Based on advice received from Murtons City Buses, the sole school bus provider in Broken Hill, school buses will be operating on local roads during the following periods:

1. 8am to 9am Monday to Friday (school term)
2. 2.30pm to 3.30pm Monday to Friday (school term)

The school bus times do not clash with the peak construction traffic (buses and light vehicle) movements.

Provisional advice received from Murtons City Buses is that there are no school bus routes past the construction site.

First Solar is committed to minimising potential effects on local school bus services and will work to schedule the delivery to construction materials (including plant and equipment) to periods outside of the school bus times indicated above (as far as practicable).

4.1.3 Vehicle Logistics and Coordination at Site

First Solar has the experience and expertise to ensure that the vehicles transporting materials and or employees:

- Arrive at site in an orderly manner – all personnel working on site will be inducted with entering and exiting the site
- Meet the resources available to undertake the offloading of goods
- Do not cause platooning
- Will arrive within the approved delivery times.

It is expected that the peak periods for the vehicles transporting materials and / or employees will not impact on the local road network, given the proposed management measures and the very low existing traffic volumes on the routes in the vicinity of the power station site.

The Environmental Impact Statement (EIS) has previously confirmed that the wider effects of this routing of construction vehicles to / from the site can be accommodated satisfactorily, without additional mitigation measures.



4.1.4 Logistics of Site Deliveries

To ensure that the materials are delivered onsite, on time, First Solar will have a logistics coordinator dedicated to the Broken Hill project. This logistics employee will be responsible for liaising with the Project Managers at the haulage companies on a daily basis and will monitor and manage the program and delivery schedules. The scheduling of the materials (including plant and machinery) will be programmed to ensure that the delivery times do not coincide, whilst maintaining the deadlines of the construction program. There are some limitations to the haulage movements and number of deliveries to site each day from the origin, which will therefore limit the potential for vehicles to impact the network i.e. convoys or platoons. Some of the key milestones monitored by the logistics coordinator will include the following:

- Schedule of next day and 2-day forecast of all deliveries, including inventory and time of arrival
- Expected shipping date and transportation travel time
- Number of containers from each supplier
- Transit time from point of origin
- Estimated Time of Arrival (ETA) and Estimated Time of Departure (ETD)
- Date reports of each shipment are available and accessible online
- Daily communication with transport companies are undertaken to understand updates on programming and travel times.

First Solar has developed a draft schedule for truck movements where trucks will be scheduled to arrive at the highway at a specific time of day, in order to satisfy community and safety concerns raised on previous projects.

The use of road trains, i.e. from the Port in Adelaide, will be used where possible to reduce the total number of heavy vehicle movements in and out of the site.

4.2 Driver Code of Conduct and Site Inductions

First Solar relies on freight haulage companies for the delivery of construction materials to site. The outsourcing of haulage puts a requirement on haulage companies to manage their drivers within the bounds of the legislative requirements from the NSW Code of Practice for Long Haul Drivers, i.e. log book entries, verification of licenses etc.

On arrival to site First Solar will induct all haulage drivers in to the site. During this induction process First Solar will ensure compliance by its haulage company(ies) to the NSW Code of Practice for Long Haul Drivers. Long haul drivers will be prevented from driving from the site where they are found to be operating in a manner that is not in accordance with the requirements of the NSW Code of Practice for Long Haul Drivers.



An example of a typical First Solar site induction for delivery drivers is summarised in the next section.

4.2.1 Requirements Prior to Accessing the Site

Prior to accessing site, the Non-Inducted Delivery Driver's ("non-inducted" as defined by the Project Site Safety Plan) site contact person (at the haulage company) shall complete the following with the driver:

- Site Visitor's induction
- Pre-task hazard assessment (e.g. Job Hazard Analysis (JHA)) and implementation of controls
- Communication of the intended travel route to site, travel details for the internal site delivery, onsite speed limits and internal road rules, site contact/escort name and contact number, and any work area specific hazards.

The above process will be expected to be undertaken prior to the driver commencing haulage to the site.

4.2.2 General Requirements

Once onsite, the non-inducted delivery driver will be escorted by a First Solar representative at all times when travelling to and from the site entry to any pick up or drop off point within the site.

The completed visitor induction, the pre-task hazard assessment attached to the induction and access/escort details shall be recorded and retained on the project site by First Solar.

A load/unload plan and pre-task hazard assessment (e.g. JHA) shall be completed for loading and unloading tasks on site and relevant controls implemented prior to the commencement of these tasks.

The non-inducted transport driver's licensing and competence to operate vehicle or vehicle mounted equipment shall be checked by First Solar upon entry to the site.

On arrival at the pick-up/drop off point, Non-inducted Delivery Drivers shall exit the vehicle and remain in a pre-defined safe area whilst loading and unloading of freight is occurring, unless they are performing one of the tasks as outlined below.

Non-inducted Transport Drivers shall not perform any tasks other than:

- Driving to the designated drop-off or pick-up location within the site
- Indicating the load distribution to First Solar personnel
- Operating vehicle and vehicle mounted loads for which they are competent, including discharge of material if required
- Performing release of load restraints on incoming loads
- Performing restraint of outgoing loads (if applicable); and / or
- Completing any required paperwork.



First Solar has driver behavioural expectations and a site delivery process, which includes:

- Engagement of local drivers (where practicable) to ensure familiarity with the haulage routes
- Planned layover areas defined in advance by haulage company Project Management
- Directions of approach to site are documented and specified in advance to the freight companies
- Arrival at pre-determined and approved time with logistics, deliveries undertaken in a manner that is not in accordance with First Solar requirements may result in the truck being turned away and a complaint made to the haulage company
- Driver site induction, including security gate process, consideration and courtesy are essential when driving on public roads; and Speed limits must be strictly adhered to (30 km/hr on site)
- Logistics will escort all delivery vehicles to laydown areas

Note: This process does not apply to persons delivering or collecting cash, mail or packages and/or conducting similar brief transactions.

4.3 Statutory Responsibilities

The Environmental Impact Statement (EIS) was prepared by Sinclair Knights Merz (SKM) in relation to the planning application for the Broken Hill Solar PV Power Station. The EIS identified relevant statutory framework within which the planning application was considered.

Of relevance to the preparation of this Construction Traffic Management Plan are the following statutory documents:

4.3.1 Roads Act 1993

Under Section 138 of the Roads Act 1993 (Roads Act), the roads authority regulates the undertaking of various activities in, on and over public roads and consent shall be obtained from the relevant roads authority.

The Barrier Highway is a classified road and is under RMS jurisdiction. In accordance with the its agreement with First Solar, responsibility for consultation with the RMS with regards to the upgrade of the site access and Barrier Highway intersection is that of the Proponent (AGL).

4.3.2 State Environmental Planning Policy (Infrastructure) 2007

The EIS identified Clause 104 of the State Environmental Planning Policy (Infrastructure) 2007 (ISEPP), which relates to traffic generating developments. Clause 104 identifies a requirement for further referral to the Roads and Maritime Services (RMS). The EIS concluded that for the purposes of power generation, the requirement of Clause 104 does not apply as the Broken Hill Solar PV Power Station project as the project would result in the generation of fewer than 200 vehicles per day during construction or operation. On this basis Clause 104 was deemed to be not applicable. This is supported by the figures in Section 3.4.3.



There is therefore the determination of Beca that no obligation exists to refer the matter to RMS in the context of Clause 104 (traffic generating developments).

4.4 General Measures to Minimise Interactions

4.4.1 Access Intersection Upgrades

Some proposed upgrades at the intersection of Barrier Highway and the site access are identified in the Broken Hill Solar Power Plant Environmental Impact Statement (SKM, October 2012). The report states that upgrades of the intersection is required to allow for safe entry and exit of vehicles from the site to maintain efficiency of traffic flow on Barrier Highway.

Based upon an assessment of existing traffic data along the Barrier Highway and the expected traffic volumes accessing the site, Figure 4.9 from Austroads Guide to Road Design – Part 4A it has been used to determine that a Basic Left Turn (BAL) and Basic Right Turn (BAR) type access arrangement is considered appropriate (refer Figures 7.5 and 8.2 of Austroads Guide to Road Design Part 4A, 2010). Figure 7 below shows the assessment detail for the proposed intersection for the AM peak period when the turning volumes into the site will be the highest. The volumes from 12.8km west of Broken Hill along Barrier Highway has been used for this assessment as this would provide a better representation of the AADT rather than the volumes obtained west of Gypsum Street. The assessment has been based on the following volumes:

- Q_R / Q_L - The turning volume into the site is anticipated to be in the order of 40vph during 6am to 7am when workers arrive at site. An assumption has been made that 100% of the vehicles turn either right or left into the site providing a worst case scenario
- Q_M – the hourly count on the Barrier Highway in 2010 – 2011 (axle pair count) for the 6am to 7am period was 24vph. Allowing for 2 years of traffic growth at 2% per annum to predict a 2014 volume gives an hourly traffic flow in the order of 25vph.

These arrangements are the minimum treatment for use on high speed rural environments such as the Barrier Highway. They are suited to low traffic volumes and provide a suitable safety environment for through-traffic utilising the highway and turning vehicles accessing the site.



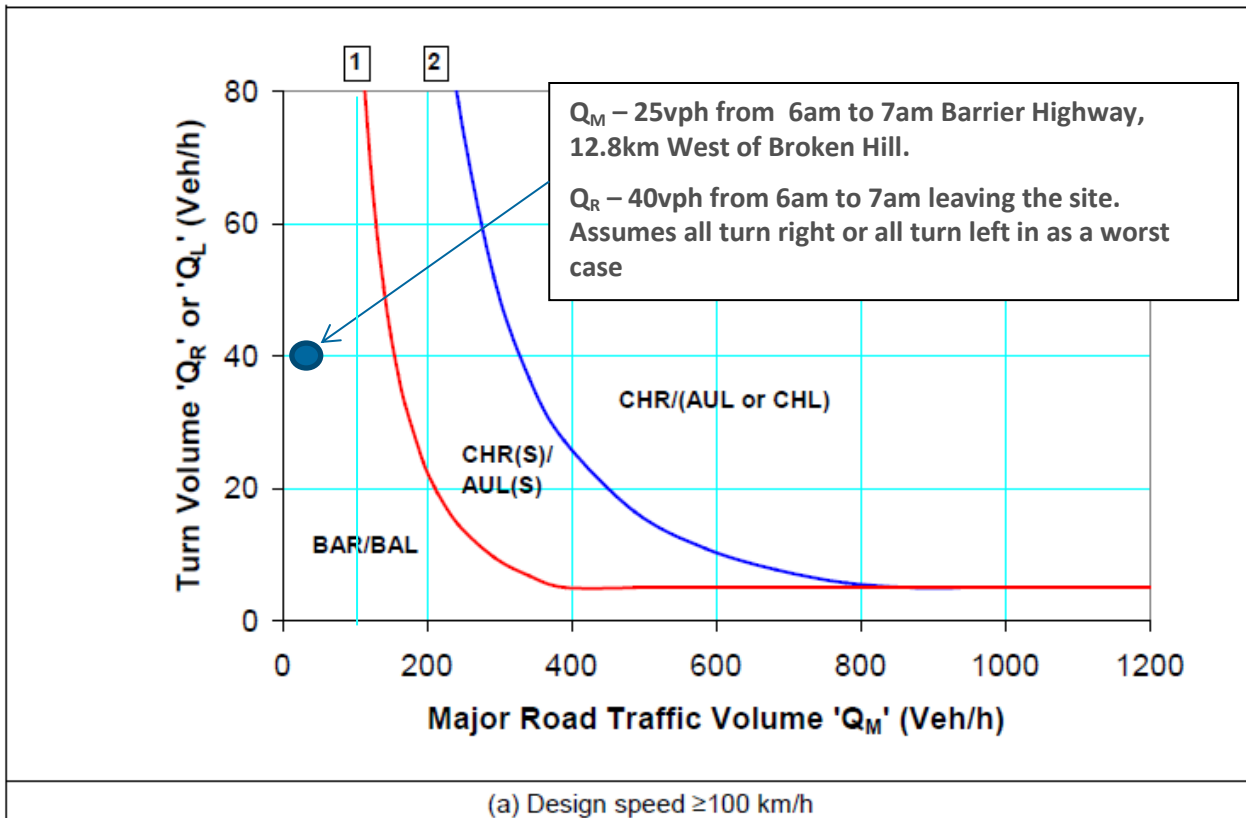


Figure 7 Warrants for Turn Treatments in rural area – AM peak period flows

A check has also been made of for the PM peak when vehicles are leaving the site as this is when the flows on the Barrier Highway are higher, which is shown in Figure 8. This shows that during this period A BAR / BAL is also suitable for this access.

- Q_L - The turning volume out of the site is anticipated to be in the order of 40vph during 5pm to 6pm period when workers leave the site. An assumption has been made that 100% of the vehicles turn either right or left out of the site providing a worst case scenario
- Q_M - the hourly count on the Barrier Highway in 2010 – 2011 (axle pair count) for the 5pm to 6pm period was 77vph. Allowing for 2 years of traffic growth at 2% per annum to predict a 2014 volume gives an hourly traffic flow in the order of 80vph.



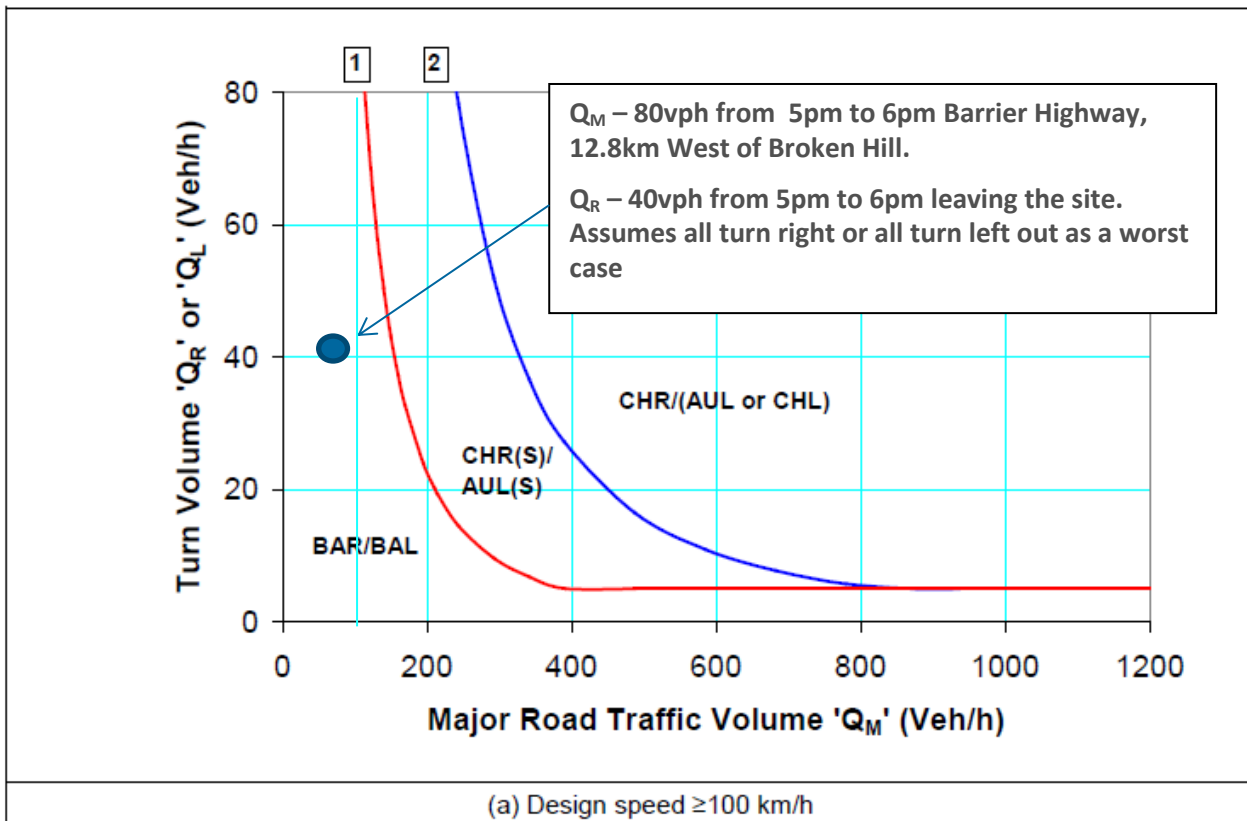


Figure 8; Warrants for Turn Treatments in rural area – PM peak period flows

An assessment of sight distances at the site access along the Barrier Highway suggests that there is suitable unrestricted visibility to accommodate the proposed intersection arrangement at its current location. The available sight distance was greater than 300m, which is the required safe intersection sight distance for a design speed of 110km/h, as detailed in Austroads Guide to Road Design Part 4A Unsignalised and Signalised intersections - Table 3.2.

A conceptual desktop assessment of traffic safety has been undertaken based on the expected turning volumes and sight distances available at the intersection as detailed above and there are not expected to be any significant safety concerns at the intersection. However it is noted that further road safety audits will be required during the design stages of the intersection upgrade.

4.4.2 Livestock Safety

AGL will work with the neighbouring landowners to identify and undertake fencing to ensure that the access road is fenced with livestock proof fencing prior to construction commencing.

4.4.3 Speed Limits

As described above in Section 4.2, all haulage personnel driving construction vehicles (including light project vehicles) to and from the site will be inducted prior to reaching the site. The induction will cover the legislative requirements as well as the requirements of First Solar.



Speed limits within the site will be imposed by First Solar to provide safe movement within the site, where required and have been set at 30 km/hr. The speed and vehicle movement requirements will be detailed within the onsite Vehicle Movement Plan (VMP) being separately prepared by First Solar as part of the Project Site Safety Plan. It is expected any driver operating a vehicle within site will be inducted and required to adhere to the posted speed limits. Vehicle movement requirements will form part of the General site H&S induction.

4.4.4 Restricted Vehicle Access

Restricted Access Vehicles (RAV, or over size / dimension vehicles) will be required to deliver construction equipment to site. The delivery of construction equipment will be the primary responsibility of the civil sub-contractor who will be expected to manage this process in accordance with First Solar expectations / requirements. Delivery of equipment to site using an RAV will need to consider the following:

- Appropriate permits being issued by RMS and the NSW Police
- Use of escort vehicles as required
- Provision of traffic controllers as required
- Restriction of RAV deliveries to daylight hours (outside of school bus hours)
- The delivery of large equipment will be coordinated with any known vehicular activity on the Barrier Highway or in the Broken Hill area.

Acceptance of the TMP has been obtained from the Broken Hill City Council on 26/9/14. This endorsement refers to the requirements to seek prior approval from the relevant agencies for various vehicle movement classes. This correspondence is attached in Appendix G - Agency Consultation.

5 Traffic Management Plan Implementation

5.1 Roles and Responsibilities

The roles and responsibilities for the implementation of the TMP are indicated in the following table:

Implementation Entity Role:	Responsibility:
First Solar	Implementation of the Construction Traffic Management Plan
All Personnel (including haulage drivers)	Follow and adhere to all guidelines and project rules with respect to traffic management both external and internal to the project site
Road haulage companies utilised by First Solar	Implementation and adherence to the First Solar Construction Traffic Management Plan, with particular respect to haulage driver requirements



5.2 Traffic Management Plan Audit and Review

The TMP will be audited and reviewed in accordance with AGL Environmental Management Systems.

5.3 Competence Training and Awareness

All personnel working on the project will undergo a project site induction in accordance with the the First Solar Worker Environmental Awareness and Compliance Training procedure (Appendix CEMP-S).

The combined First Solar Health, Safety and Environment induction for the Broken Hill Solar PV Power Station will include information on the management of traffic related issues while travelling to and from the site. The induction will include the following points:

- Consideration and courtesy are essential when driving on public roads and the worksite
- All employees will be required to comply with the onsite Vehicle Movement Plan being prepared by First Solar
- Speed limits must be strictly adhered to within the site and on the public roadways
- All personnel must only utilise the identified routes to, from and within the site.

After completing the induction workers will sign a statement of attendance and records of this will be kept in the site office.





Landscape of the proposed Broken Hill Solar Plant



Environmental and
Heritage Management P/L

Aboriginal Heritage Management Plan

Broken Hill Solar Plant

Broken Hill Local Government Area

Report Prepared by
OzArk Environmental & Heritage Management Pty Ltd
for
AGL Energy Limited

OzArk EHM
145 Wingewarra St
(PO Box 2069)
Dubbo NSW 2830

Phone: (02) 6882 0118
Fax: (02) 6882 0630
jodie@ozarkehm.com.au
phil@ozarkehm.com.au
www.ozarkehm.com.au

Document Controls

Proponent	AGL		
Client	AGL		
Project No / Purchase Order No			
Document Description	Aboriginal Heritage Management Plan: Broken Hill Solar Plant		
	Name	Signed	Date
Clients Reviewing Officer			
Clients rep managing this document	OzArk Person(s) managing this document		
Jillian Adams	Dr Jodie Benton		
Location	OzArk Job No.		
Z// drive	869		
Document Status V	Date		
V1 OzArk 1 st Internal (Series V1.1 = OzArk internal edits)	V1.0 May 2013 V1.0 edits received from AGL 22.5.13		
Draft V2.0 Report Draft for release to client (Series V2.x = OzArk and Client edits)	V2.0 to AGL 11 June 2013 V2.1 to AGL 24 July 2013 Comments received from OEH/AGL July 2013 V2.2 to AGL & RAPs 22 August 2013		
FINAL once latest version of draft approved by client	V3.0 sent to AGL and RAP's 3 October 2013		
Prepared For	Prepared By		
Doug Landfear Manager Power Development (Solar) AGL Energy Limited Locked Bag 1837 St Leonards NSW 2065 M: 0448 816 098 T: 02 9921 2201 F: 02 9921 2401 E:dlandfear@agl.com.au	Dr Jodie Benton OzArk Environmental & Heritage Management Pty. Limited P 02 6882 0118 F 02 6882 6030 M 0431 082 768 Email: jodie@ozarkehm.com.au		

COPYRIGHT

© OzArk Environmental & Heritage Management Pty Ltd, 2013 and © AGL 2013

All intellectual property and copyright reserved.

Apart from any fair dealing for the purpose of private study, research, criticism or review, as permitted under the Copyright Act, 1968, no part of this report may be reproduced, transmitted, stored in a retrieval system or adapted in any form or by any means (electronic, mechanical, photocopying, recording or otherwise) without written permission. Enquiries should be addressed to OzArk Environmental and Heritage Management Pty Ltd.

Contents

Contents.....	3
Figures	3
1 Introduction.....	4
1.1 Background.....	4
1.1.1 Legislative framework.....	4
1.2 Objectives of the ACHMP	5
2 Aboriginal Community Consultation	7
2.1 Aboriginal community consultation towards the EA	7
2.2 Aboriginal Community Consultation in reference to this ACHMP	7
2.3 Protocol for continued Aboriginal community consultation	9
3 Agency Consultation	9
4 The Aboriginal Heritage Resource	10
4.1 Identified Aboriginal Cultural Heritage	10
4.2 Cultural Values.....	14
4.3 Summary of Impacts.....	14
5 Recommended Management of the Aboriginal Heritage Resource	15
5.1 Specific Management for Impacted Sites.....	15
5.2 Specific Management for Avoided Sites	15
5.3 Fate of Artefacts.....	15
5.4 General Management Measures	16
5.4.1 Unanticipated Finds Protocol.....	16
5.4.2 Aboriginal heritage inductions for work crew members	16
6 References	17
Appendix 1: Contact List of Aboriginal Stakeholders	18
Appendix 2: Community Correspondence Log for ACHMP.....	19
Appendix 3: Aboriginal Focus Group Meeting Minutes	26

Figures

Figure 1: Locality Map (Source: AGL 2012).....	6
Figure 2: Aboriginal sites over the Broken Hill Solar Plant Study Area.....	13

1 Introduction

This Aboriginal Cultural Heritage Management Plan (ACHMP) was commissioned by AGL Energy Limited (AGL). The purpose of this document is to synthesise the recommendations pertinent to the management of recorded Aboriginal heritage sites over the Project Area for the construction of the Broken Hill Solar Plant. This document has been developed in consultation with registered Aboriginal stakeholders and the NSW Office of Environment and Heritage (OEH). It consolidates the appropriate responsibilities and actions that the Proponent shall undertake in terms of managing impacts to the identified heritage resource over the approximately 200 hectare (ha) area of the proposed Broken Hill Solar Plant, located approximately 5km southwest of Broken Hill.

1.1 Background

1.1.1 Legislative framework

This project was assessed, and approved¹, under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Despite this, Condition B32 maintains a role for OEH and they must be notified in relation to impacts to previously unidentified Aboriginal cultural heritage. Specifically Condition B32 of the Planning Approval requires:

If during the course of construction the Proponent becomes aware of any previously unidentified Aboriginal object(s), all work likely to affect the object(s) shall cease immediately and the OEH informed in accordance with the National Parks and Wildlife Act 1974. In addition, registered Aboriginal stakeholders shall be informed of the finds. Works shall not recommence until an appropriate strategy for managing the objects has been determined in consultation with the OEH and the registered Aboriginal stakeholders and written authorisation from the OEH is received by the Proponent.

Further, Condition C3 (f) of the Planning Approval requires that:

an Aboriginal Heritage Plan to monitor and manage Aboriginal heritage shall be developed in consultation with the OEH and registered Aboriginal stakeholders, and include the following:

- (i) details of further archaeological investigations and/or salvage measures to be carried out prior to construction;*
- (ii) procedures for the management of identified objects within the project site;*
- (iii) procedures for dealing with unidentified objects and/or human remains;*
- (iv) Aboriginal cultural heritage induction processes for construction personnel; and*
- (v) Procedures for ongoing Aboriginal consultation and involvement.*

¹ Project Approval Section 75J of the Environmental Planning & Assessment Act 1979, NSW Department of Planning and Infrastructure, 27th March 2013 (the Planning Approval).

Development of this document is in accordance with Condition C3 (f) and provides the basis for managing Aboriginal heritage over the Project Area. This ACHMP is based on the recommendations of the Aboriginal heritage report (OzArk 2012) within the Environmental Assessment for the project, as well as the results of Aboriginal community stakeholder consultation, which occurred throughout the assessment and will continue to occur through the development of this plan. This ACHMP also provides mechanisms for the management of both known heritage sites as well as previously unidentified items of Aboriginal heritage, in line with Condition B32 of the Planning Consent, should they be revealed as the project progresses.

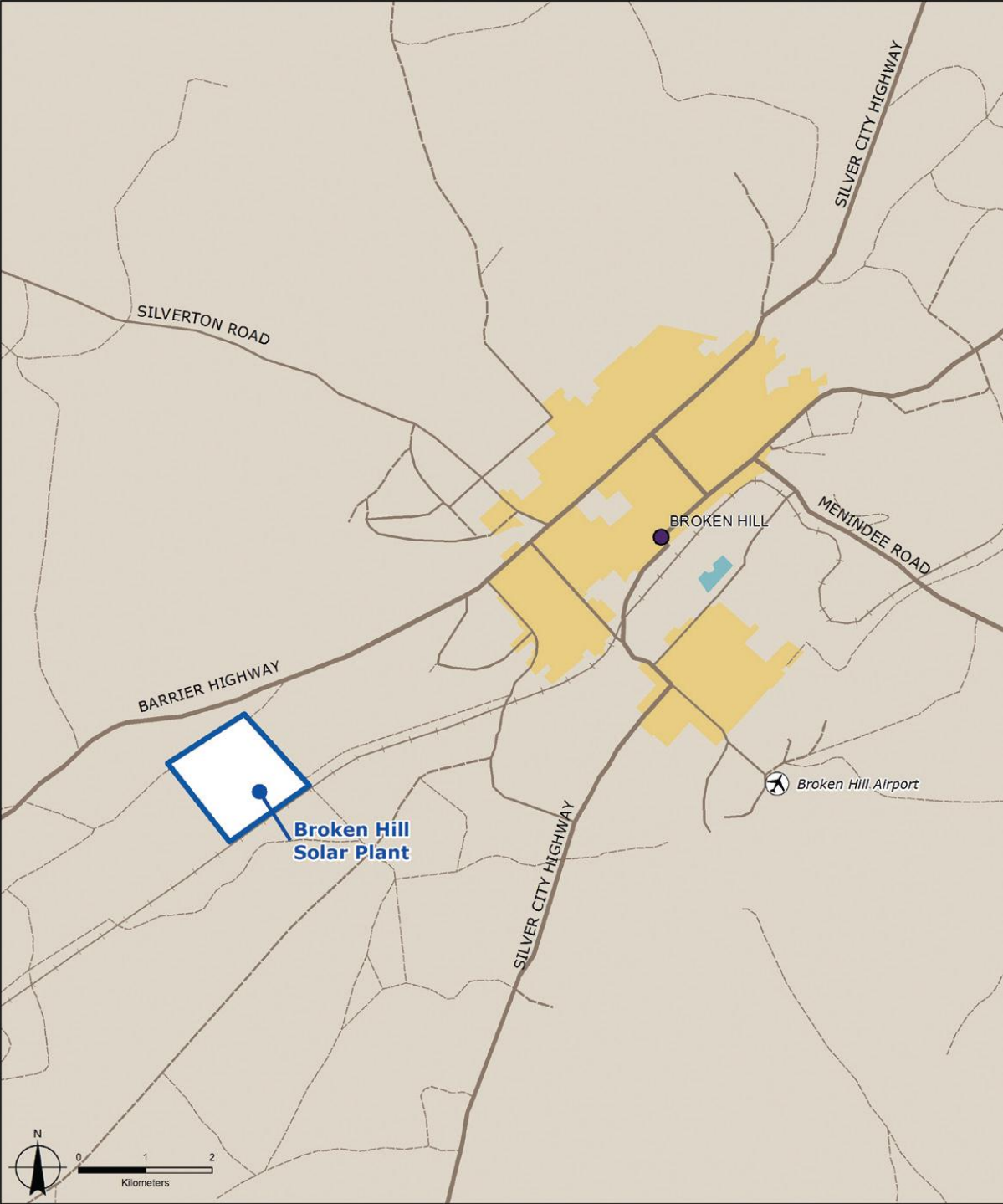
This ACHMP is to remain as a 'live' document. It should be updated / revised at any time when additional ground surface disturbing impacts relating to the project are proposed or every three years, whichever comes sooner.

1.2 Objectives of the ACHMP

This ACHMP addresses the specific issues associated with, and the management of, Aboriginal cultural heritage which is of significance to the Barkandji people of the Broken Hill area. This plan provides information and actions required to:

- Protect both identified and unidentified Aboriginal cultural heritage from damage or harm;
- Ensure that in the event that Aboriginal cultural heritage cannot be protected that appropriate management measures, such as salvage and storage of Aboriginal cultural heritage material, are implemented; and
- Ensure that effective and open consultation with the Barkandji people occurs through establishment of an Aboriginal Heritage Working Group (AHWG) comprised of identified stakeholders.

Figure 1: Locality Map (Source: AGL 2012).



2 Aboriginal Community Consultation

2.1 Aboriginal community consultation towards the EA

Consultation for this project was undertaken according to the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (ACHCRs). Stage 1 of the ACHCRs commenced on 17 November 2010, with letters sent to all relevant potential stakeholders seeking expressions of interest (EOIs) and with advertising in the Barrier Daily Truth on Nov 20, 2010 (See OzArk 2012: Appendix 1 for copies). Negotiations with Broken Hill Local Aboriginal Land Council (BHLALC) for the provision of a Site Officer also commenced concurrently, resulting in Ms Dulcie O'Donnell and Ms Raelene O'Donnell (trainee) representing BHLALC on all survey days.

Following the field assessment, EOIs were received from Mutawintji National Park Board of Management (Mutawintji NPBOM) and Mutawintji Local Aboriginal Land Council (Mutawintji LALC).

ACHCR Stage 2/3 letters presenting information about the proposed project and describing the proposed heritage assessment methodology were sent to all stakeholders with a request for any specific cultural information (should any be available), as well as inviting comment / input on the methodology proposed. Patrick Laughton, a representative of both Mutawintji NPBOM and Mutawintji LALC, acknowledged receipt of the project details and advised it would be presented to the Board of both organisations. Although formal feedback was not received from BHLALC, they provided two representatives to participate in an additional survey focussed on the transmission line for the project.

After a temporary halt to the proposed project in 2011, a copy of the draft report was issued to registered stakeholders on 26th July 2012 and feedback was invited within the recommended twenty eight (28) day time frame. A log and copies of correspondence with Aboriginal community stakeholders is presented in OzArk 2012, Appendix 1. It is noted that no comments were received from the Registered Aboriginal Parties (RAPs) at that time.

Subsequent to the EA being placed on public exhibition, correspondence was received from the NTSCorp² in relation to the project. Return correspondence from AGL noted that initial letters had been sent to NTSCorp in 2010 (as well as to other listed on the Barkandji Traditional Owners #8 Native Title Claim), but that no response had been received at that time. As a result of this recent communication, the Barkandji Traditional Owners #8 Native group has been added as a Registered Aboriginal Party for consultation over this ACHMP.

2.2 Aboriginal Community Consultation in reference to this ACHMP

Development of this ACHMP began in April 2013 subsequent to notification that the Broken Hill Solar Plant had been approved by the NSW Department of Planning & Infrastructure.

² From Mr Ross Mackay, Strategic Projects Officer, on Feb 21 2013.

A draft of this document was prepared and distributed to the RAPs and OEH and an Aboriginal Focus Group Meeting (AFGM) was scheduled for the management plan to be discussed.

The AFGM was held on August 15th, 2013. Letters of invite with the draft ACHMP were sent to all RAPs (on July 27th 2013). Present on the day were Maureen O'Donnell (representing the Wilyakali Aboriginal language group, as well as the Barkandji Traditional owners #8 Native Title Claim and the Mutawinji National Park Board of Management); Joanne O'Donnell (CEO, Broken Hill LALC); Dulcie O'Donnell (Sites officer, Broken hill LALC) and Raymond O'Donnell (Broken Hill LALC). Representing AGL was Doug Landfear, representing First Solar was Nicole Ghiotti, Sean Greene and Gavin Randall. Sheridan Baker and Jodie Benton represented OzArk EHM. Minutes of the meeting can be found in **Appendix 3**.

Overall, the management as presented in the draft ACHMP was supported by those present. The following points reflect the specific issues raised / discussed:

- Use of the term 'Aboriginal community groups' or 'Registered Aboriginal Parties' was noted as being inappropriate and not specific enough, by Ms Maureen O'Donnell. She would prefer that reference be made to the accepted Traditional Owners of the area, being the Wilyakali people (language group), and specifically those that can be contacted through the Broken Hill LALC. OzArk undertook to make changes to parts of this ACHMP where it was appropriate.
- Management for the salvage of sites to be impacted must always include a representative from the Wilyakali people (language group), as contacted through the Broken Hill LALC.
- That artefacts salvaged from the sites to be impacted be moved to the surface of the ground near one of the sites that will not be impacted, preferably furthest from the impact footprint. This location will be recorded via GPS, photographed and OEH informed. It was made very clear that burial of these artefacts beneath the surface was not supported.
- If any Aboriginal cultural material is found during construction or operation, the Wilyakali people, as contacted through the Broken Hill LALC, should be informed (note this is already a protocol within this ACHMP).

It was agreed that necessary edits to this ACHMP would be made prior to August 23rd 2013 so that the edited (final) version could be provided back to the BH LALC prior to the LALC monthly meeting which is to be held on August 26th 2013. This will allow the ACHMP to be tabled for members consideration at this meeting. No further feedback was received and the draft report was deemed as accepted.

2.3 Protocol for continued Aboriginal community consultation

Under this ACHMP a number of Aboriginal cultural heritage sites that will be impacted by the project will be salvaged, while others will be protected via fencing, signage and workforce inductions (**Section 5**).

For the purpose of any further consultation, it is suggested that the Traditional Owners, identified as the Wilyakali people (as contacted through the Broken Hill LALC) be the primary point of contact.

In the event that any of the following incidents occur, AGL or First Solar will contact OEH and the Traditional Owners, identified as the Wilyakali people (as contacted through the Broken Hill LALC), as per condition B32 of the Planning Consent within 24 hours:

1. If any inadvertent impacts occur to sites beyond that which is agreed to in this ACHMP;
2. If any previously unrecorded Aboriginal sites/ objects are located in the vicinity; or
3. If any areas are to be impacted that have not as yet been surveyed for the presence of Aboriginal sites.

Contact names and details for the Wilyakali People via the Broken Hill LALC and for the other RAPs are presented in **Appendix 1**.

3 Agency Consultation

This ACHMP has been reviewed by OEH (comments received 31st July 2013) and incorporates their comments.

4 The Aboriginal Heritage Resource

4.1 Identified Aboriginal Cultural Heritage

The Aboriginal heritage component of the Broken Hill Solar Plant environmental assessment recorded fourteen (14) Aboriginal sites (BHS-1 to BHS-14). All are located within or in close proximity to the Project Site. Thirteen (13) of these sites are located within the main Project Area with a one further site identified adjacent to the transmission line easement (**Figure 2**).

The majority of these sites were located in bare alluvial fan washout areas associated with the narrowly incised ephemeral drainage channels that trend from southeast to northwest across the study area. The sites identified were either isolated stone artefacts or low density stone artefact scatters. Three raw material types were identified, being silcrete, chert and quartz, with silcrete being dominant. Detailed descriptions of each site are provided in OzArk 2012, however a summary of site information is presented here in **Table 1**.

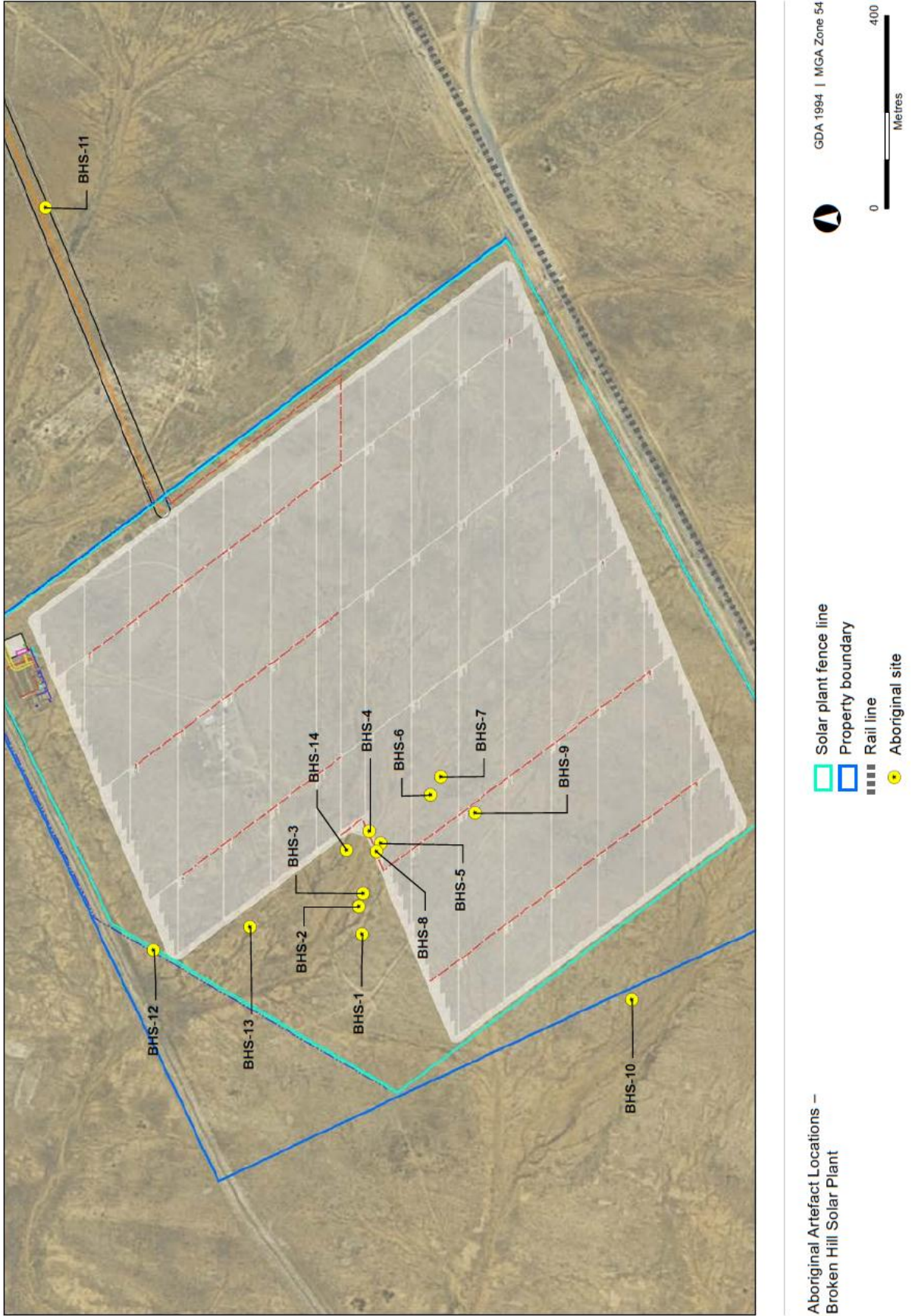
Table 1: Summary of recorded Aboriginal site data.

Site Number	Feature	Raw Material	GDA Easting	GDA Northing	Basic artefact information	Location Data
BHS-1	Isolated artefact	Silcrete	536478	6460952	Distal end of a broken silcrete flake that is retouched on the ventral surface.	BHS-1 is located approximately 85m southeast of the transmission line easement, at a bearing of 134°. The site is situated on an area of exposed alluvium less than 15m from a narrow ephemeral channel/gully
BHS-2	Isolated artefact	Silcrete	536536	6460959	A small, moderately coarse-grained silcrete, multi-platform core.	BHS-2 lies approximately 60m east of BHS-1 at a bearing of 84°. The site is situated on an exposed alluvial fan/claypan area within a sparse open chenopod shrubland
BHS-3	Isolated Artefact	Quartz	536563	6460950	A single small translucent quartz flake.	BHS-3 lies approximately 30m east of BHS-2 at a bearing of about 113°. The isolated artefact is situated on an exposed alluvial fan/claypan area within a sparse open chenopod shrubland
BHS-4	Isolated Artefact	Silcrete	536692	6460937	One small milky beige coloured silcrete flake that exhibits 5/6 negative flake scars on its ventral surface and has a feather termination	BHS-4 lies approximately 135m east of BHS-3 at a bearing of 105°. It is situated in an exposed alluvial fan washout area less than 10 m east of a

Site Number	Feature	Raw Material	GDA Easting	GDA Northing	Basic artefact information	Location Data
					in colour	small gully/ephemeral channel
BHS-5	Isolated Artefact	Silcrete	536667	6460912	A single small silcrete flake with retouch on its ventral margins and a feather termination. The artefact is made of a yellow, generally fine grained silcrete with some coarse inclusions.	BHS-5 lies approximately 25m west of BHS-4 at a bearing of 270°. It lies on an exposed alluvial fan washout area about 5 m west of the channel bank of a small ephemeral gully.
BHS-6	Isolated artefact	Chert	536767	6460809	One small beige chert artefact. The artefact is broken and is without its distal portion.	This site is situated c. 140m southeast of BHS-5 at a bearing of 137°. It is within a large area of exposed alluvial fan/claypan in between two incising ephemeral channels that intersect each other approximately 20 m to the north of the site
BHS-7	Isolated Artefact	Silcrete	536805	6460788	One single milky white/ beige silcrete artefact that is broken and retains its proximal portion only.	BHS-7 is located approximately 140m north of BHS-6, and approximately 120m east of BHS-4. It lies in a large area of exposed alluvial fan/ claypan about 20m to the west of a narrowly incising gully
BHS-8	Isolated Artefact	Chert	536649	6460922	One very small beige/light cream, banded chert flake. The flake exhibits retouch on its ventral surface and has an incomplete 'snapped' feather termination.	BHS-8 lies about 25m northwest of BHS 5 immediately adjacent to the west bank of a narrow incising ephemeral channel. It lies at the northern edge of a small gully that drains eastward towards this main ephemeral channel.
BHS-9	Artefact Scatter	Quartz (n=6)	536730	6460717	A small, approximately 5 x 8 m milky quartz artefact scatter. It is comprised of about 6 flakes, at least 7 flaked pieces and a number of smaller quartz fragments.	This site is situated in bedrock colluvial deposits in the elevated portion of the study area approximately 90m east of the western boundary fence of the large fenced paddock that surrounds the residential portion of the study area

Site Number	Feature	Raw Material	GDA Easting	GDA Northing	Basic artefact information	Location Data
BHS-10	Isolated Artefact	Silcrete	536343	6460392	A single broken yellow silcrete flake with negative flake scars on the ventral surface.	BHS-10 lies about 570m north of the southwest corner/southern boundary fence of the study area. It lies in an exposed alluvial fan/claypan area that is associated with the large ephemeral channel that marks the western margins of the study area.
BHS-11	Artefact Scatter	Silcrete (n=3)	537986	6461608	A low density artefact scatter that comprises three silcrete artefacts in loose association within an approximately 25 x 6 m area.	The site is located east of the main study area along the transmission line easement. It lies approximately 70m east of a shallowly incised (0.5-1m deep) ephemeral channel and about 10m south east of Pole #387 of the 222 kV electricity transmission line.
BHS-12	Artefact Scatter	Silcrete (n=2) Chert (n=1)	536445	6461385	Three artefacts in a small scald.	In alluvial fan washout/claypan/scald in sparse low chenopod shrubland c. 60m south of the Old Adelaide Road disturbance Corridor and 130m east of the dam in the northwest portion of the study area.
BHS-13	Isolated artefact	Silcrete	536493	6461184	One single, pale yellow silcrete flaked piece, with coarse conclusions.	In exposed alluvial fan washout/claypan in sparse low chenopod shrubland c. 180m southeast of the Old Adelaide Road disturbance corridor.
BHS-14	Isolated artefact	Silcrete	536652	6460984	A single pale yellow silcrete flake that exhibits two planes of artefact manufacture.	In exposed alluvial fan washout claypan/scald in sparse low chenopod shrubland c. 110m southeast of the transmission line that transects the study area; and c. <10m of the incised ephemeral channel.

Figure 2: Aboriginal sites over the Broken Hill Solar Plant Study Area



Summary

The archaeological evidence from the Broken Hill Solar Plant Project Area is consistent with the broader archaeological record of the Broken Hill Complex Bioregion. A preponderance of isolated finds and/or low density artefact scatters at or nearby a main ephemeral channel is a frequently observed phenomenon in this arid environment. This is a function of the lack of available water and its concomitant negative effect on the carrying capacity of this local environment and the geomorphic processes of wind and water erosion that have acted to reveal such Aboriginal objects in these disturbed contexts.

4.2 Cultural Values

The cultural significance of the Aboriginal objects identified over the Broken Hill Solar Plant Project Area to the local Aboriginal community was documented during the assessment. Discussions with the Chair of the Broken Hill Local Aboriginal Land Council, Mrs Maureen O'Donnell, points to the view that stone artefacts wherever deposited represent the *in situ* use of that landscape by ancestral Aboriginals at some time in the past. The Aboriginal field participants did not indicate that there was any known site(s) or area(s) within the Project Area that held specific cultural significance for the wider Aboriginal community. Nevertheless it was noted that the highly significant Aboriginal Place "The Pinnacles" was a dominant feature on the western horizon of the Project Area, and the use of the landscape of the study area by Aboriginal people was expected given its close relative proximity to such an important site.

4.3 Summary of Impacts

Eight (8) of the fourteen (14) recorded Aboriginal sites are located within the Impact Footprint for the Broken Hill Solar Plant (white shaded area, **Figure 2**), being sites BHS-4 through BHS-9, BHS -12³ and BHS-14.

Although construction of the overhead transmission line may impact one Aboriginal site, it is considered possible to avoid this impact by pole placement and access to the transmission line being controlled in relation to the artefacts of site BHS-11.

Five (5) sites (BHS1, BHS-2, BHS-3, BHS-10⁴ and BHS-13) are outside the proposed project area, but care will be needed to ensure their protection through both the construction and operational phases of the solar plant. These avoided sites will require mitigation measures (temporary fencing etc.) to ensure their protection against inadvertent impacts during project construction.

³ Although not located within the white shaded impact footprint (Figure 2), this site is directly along the proposed fenceline.

⁴ This site is located outside the boundary of land to be leased by the Proponent for the project and will therefore be outside its control.

5 Recommended Management of the Aboriginal Heritage Resource

5.1 Specific Management for Impacted Sites

The eight (8) Aboriginal sites within the Impact Footprint of the project (BHS-4, BHS-5, BHS-6, BHS-7, BHS-8, BHS-9, BHS-12 and BHS-14) will be salvaged via surface collection.

Six of these sites are isolated finds, while two are small artefact scatters of quartz flakes. These sites will be relocated using GPS and the artefacts will be retrieved.

As six of these sites are isolated Aboriginal objects, it is noted for the purpose of this ACHMP that it is possible that some of these isolates may be challenging to relocate for salvage and/or new revealed artefacts may be present on the surface.

5.2 Specific Management for Avoided Sites

Sites BHS-1, BHS-2, BHS-3, BHS-10 and BHS-13 are outside the proposed project footprint.

Site BHS-11 is a deflating artefact scatter that may have some hearth / ground oven material in association. Management of the surface manifestations of this site in reference to the overhead transmission line construction should be undertaken as follows:

- In the company of a qualified Aboriginal sites officer from the Wilyakali people (through the BH LALC) and if required an archaeologist, the Proponent will peg out the impact footprints of the transmission line in the vicinity of the site.
- Where possible the transmission line poles and access track will be sited so as to span the artefactual material.
- If surface artefacts cannot be avoided these objects will be collected and removed.

Sites BHS-1, BHS-2, BHS-3, BHS-10 and BHS-13 are currently outside the project impact areas. Care should be taken to ensure that changes to construction footprints do not endanger these sites into the future. Due to the proximity of the majority of these sites (excluding BHS-10, which is outside the lease area of the Broken Hill Solar Plant) to the project impact areas, the Proponent will ensure that they are fenced and that all staff and contractors are aware of the location of the sites and their legislative protection under the NPW Act 1974. Fencing for these sites will be with high visibility, temporary orange mesh which will be removed once construction is complete.

5.3 Fate of Artefacts

The final fate of objects retrieved via surface salvage was determined by the Traditional Owners at the AFGM. This will entail collecting the artefacts and placing them at one of the recorded sites outside the Impact Footprint. The artefacts are to be placed on the surface, photographed and a GPS point taken. This information will then be forwarded to OEH via Aboriginal Site Impact Record forms for the salvaged sites.

5.4 General Management Measures

5.4.1 Unanticipated Finds Protocol

Should any previously unidentified Aboriginal object or site be revealed during construction, then work in the area should cease and the local vicinity of the find should be cordoned off until confirmed by a Wilyakali Traditional Owner representative or an archaeologist.

If the object or site is Aboriginal in origin, a detailed recording of the object (s) will be prepared. If the site is similar to the previously recorded sites (an isolated artefact, or a small scatter of less than 5 stone artefacts made of silcrete, quartz or chert), it will be managed in the manner outlined in 5.1 (above). If the site type is not consistent with those previously recorded, an OEH representative and the Wilyakali people should be contacted to discuss how best to proceed.

Should suspected ancestral human remains be encountered, the following process should be adhered to:

- Do not further disturb or move the remains;
- Immediately cease work in the vicinity and cordon area off;
- Notify the NSW Police;
- Notify the OEH's Environment Line on 131555 as soon as practicable and provide available details of the remains and their location; and
- Do not re-commence work in the area unless authorised in writing by OEH.

5.4.2 Aboriginal heritage inductions for work crew members

Members of the construction team, including sub-contractors, machine operators and truck drivers, etc. should undergo site induction concerning Aboriginal cultural heritage issues, prior to working on the site. This would preferably be undertaken by an individual who has a good working knowledge of Aboriginal sites and of the legislation protecting them. This induction should inform workers / contractors of the location of sites within the Project Area, and of their legislative protection under Section 90 of the *NSW National Parks and Wildlife Act 1974*. Those workers attending such inductions will sign a register indicating their understanding of the cultural importance and legislative requirements to protect Aboriginal sites. Such inductions assist greatly in avoiding inadvertent impact to Aboriginal sites.

Should any areas not assessed during the 2010 Aboriginal heritage assessment (OzArk 2012) become necessary to impact for the Broken Hill Solar Plant, then appropriate survey, assessment and consultation with the Aboriginal community should occur prior to project impacts occurring.

6 References

- | | |
|---------------|---|
| AGL 2012 | Broken Hill Solar Plant Fact Sheet. |
| OzArk 2012 | Aboriginal Archaeological Assessment: Proposed Solar Project in Broken Hill. Report prepared for SKM on behalf of AGL. |
| NSW DoPI 2013 | NSW Government Department of Planning and Infrastructure: Project Approval for Application No. MP 10_0202, Broken Hill Solar Photovoltaic power plant, dated 27.3.2013. |

Appendix 1: Contact List of Aboriginal Stakeholders

Broken Hill LALC (who represent the Wilyakali traditional owners)	Joanne O'Donnell e: wwalalc@iinet.net.au
Barkandji Traditional Owners #8	Ross Mackay, Strategic Project Officer NTSCORP Level 1, 44070 Rosehill St, Redfern, NSW, 2016
Mutawintji National Park Board of Management	Pat Laughton PO Box 778 Broken Hill 2880
Mutawintji LALC	Pat Laughton PO Box 778 Broken Hill 2880

Appendix 2: Community Correspondence Log for ACHMP

COMMUNITY CONSULTATION				
Date	Organisation /	Contact Name	Comment	OzArk staff/ method
17.11.10	Barrier Daily Truth	advertising@bdtruth.com.au Kristy Tucker	advert placed to appear in Barrier Daily Truth Saturday 20th November. EOI closure date Monday 6th December	
17.11.10	DECCW	Paul Houston DECCW Po Box 2111 Dubbo 2830	sent Stage 1 Letter advising of project and requesting information of any known Indigenous organisations/individuals who may have an interest in the project. Response due 3rd December 2010	
17.11.10	NTSCORP	Mr P Schultz/Mr G Tonna Po Box 2105 Strawberry Hills 2012	sent Stage 1 Letter advising of project and requesting information of any known Indigenous organisations/individuals who may have an interest in the project. Response due 3rd December 2010	
17.11.10	ORALRA	Courtney Field ORALRA 11-13 Mansfield St Glebe 2037	sent Stage 1 Letter advising of project and requesting information of any known Indigenous organisations/individuals who may have an interest in the project. Response due 3rd December 2010	
17.11.10	NNTT	Kashana Cohen-McMeekin e: 'Kashana.Cohen-McMeekin@nntt.gov.au'	sent Stage 1 Letter advising of project and requesting information of any known Indigenous organisations/individuals who may have an interest in the project. Response due 3rd December 2010	
17.11.10	Lower Murray Darling CMA	Lesley Palmer PO Box 363 Buronga 2739	sent Stage 1 Letter advising of project and requesting information of any known Indigenous organisations/individuals who may have an interest in the project. Response due 3rd December 2010	
17.11.10	Broken Hill City Council	Mr F Zaknich Po Box 448 Broken Hill 2880	sent Stage 1 Letter advising of project and requesting information of any known Indigenous organisations/individuals who may have an interest in the project. Response due 3rd December 2010	
17.11.10	Broken Hill LALC	Members: BHLALC C/- J O'Donnell PO Box 392 (84 Oxide St) Broken Hill 2880	sent Stage 1 Letter advising of project - invite EOI by 3rd December 2010	

COMMUNITY CONSULTATION				
17.11.10	Barkandji Traditional Owners #6	c/- Principal Legal Officer NTSCORP Po Box 2105 Strawberry Hills 2012	sent Stage 1 Letter advising of project - invite EOI by 3rd December 2010	
16.11.10	Broken Hill LALC	Christine PH: 08 8087 7310 christine_bhlalc@iinet.net.au	spoke to Christine who is filling in for Joanne, asked about availability of a site officer next week and fees, advised to email through information and Christine will contact the OzArk office.	
16.11.10	NNTT	Kashana Cohen-McMeekin	received response indicating registered claim in Broken Hill LGA is Pooncarie Barkandji People #8 c/- NTSCORP Limited	
17.11.10	Broken Hill LALC	Christine	phoned, no answer, phone rang out 10.08 am	
17.11.10	Broken Hill LALC	Christine	phoned, no answer, however was able to leave message on answer machine for Christine to contact the office re: site officer availability and fee structure for engagement	
18.11.10	Broken Hill LALC	christine_bhlalc@iinet.net.au	Hi Cheryl, I have organized Dulcie O'Donnell for the sites work for next week. Jo is away until Monday so she we will send through the current Workers Compensation 'Certificate of Currency' and the fee structure when she gets back on Monday. EMAIL received from Christine Tester	
23.11.10	Broken Hill LALC	Joanne O'Donnell e: wwalalc@iinet.net.au	received relevant paperwork.	
			FIELDWORK - OzArk Maria Cotter/Pauline Hams BHLALC - Dulcie O'Donnell	
25.11.10	Broken Hill LALC	Joanne O'Donnell	Email from Joanne requesting 'approval for our trainee sites officer to receive payment for her time'. Advised by Jodie Benton that we had already submitted a variation and could not add more, suggested money be split btw the two site officers,	
01.12.10	DECCW	Paul Houston	Received response listing the following groups / individuals who may have an interest in the project area: *Barkindji Elders Council *Badger Bates *Mark Sutton William Bates *Mutawintji Board of Mgmt *Menindee Aboriginal Elders council *Wilyakali Aboriginal Corp.	

COMMUNITY CONSULTATION				
03.12.10	Barkindji Elders Council	c/- Patsy Quail Box 254 Menindee 2879 (note not as DECCW advised, have updated information)	posted Stage 1 R2 correspondence to advise of the project EOI close Tuesday 21st December	
03.12.10	Badger Bates	107 Gaffney Lane Broken Hill 2880	posted Stage 1 R2 correspondence to advise of the project EOI close Tuesday 21st December	
03.12.10	Mark Sutton	81 Morgan Street Broken Hill 2880	posted Stage 1 R2 correspondence to advise of the project EOI close Tuesday 21st December	
03.12.10	William Bates	PO Box 36 Wilcannia 2836	posted Stage 1 R2 correspondence to advise of the project EOI close Tuesday 21st December	
03.12.10	Mutawintji Board of Mgmt	at: Kim O'Donnell c/- Brett Norman NPWS Broken Hill PO Box 788 Broken Hill 2880	posted Stage 1 R2 correspondence to advise of the project EOI close Tuesday 21st December	
03.12.10	Menindee Aboriginal Elders Council	c/- Steve Millington NPWS Far West Region PO Box 788 Broken Hill 2880	posted Stage 1 R2 correspondence to advise of the project EOI close Tuesday 21st December	
03.12.10	Wilyakali Aboriginal Corp	Chairperson 84 Oxide Street Broken Hill 2880	posted Stage 1 R2 correspondence to advise of the project EOI close Tuesday 21st December	
03.12.10	ORALRA	Courtney Field ORALRA 11-13 Mansfield St Glebe 2037	received letter in mail indicating we should be in contact with the Broken Hill LALC.	
10.12.10	Mutawintji National Park Board of Management	Pat Laughton PO Box 778 Broken Hill 2880	received correspondence on behalf of Mutawintji NPBOM indication they would like to be involved in the consultation for this project.	
10.12.10	Mutawintji LALC	Pat Laughton	received correspondence on behalf of Mutawintji LALC indication they would like to be involved in the consultation for this project.	
21st December 2010 - project placed on hold - correspondence sent (dated 22/12/10) to registered stakeholder to advise them.				
03.03.11	Broken Hill LALC	Joanne O'Donnell	advised that after temporary suspension in December 2010, this project has now recommenced. Stage 2/3 letter & project detail emailed advising FW date for TL route and inviting comment on proposed methodology, EOI DATE 13 April 2011. FW 24th March 2011	CB - email

COMMUNITY CONSULTATION				
03.03.11	Broken Hill LALC	Joanne O'Donnell	emailed and spoke with Joanne who will follow this up first thing Monday, will be away for the rest of today and tomorrow.	
03.03.11	Mutawintji LALC	Pat Laughton	advised that after temporary suspension in December 2010, this project has now recommenced. Stage 2/3 letter & project detail emailed advising FW date for TL route and inviting comment on proposed methodology EOI DATE 13 April 2011	CB - email
03.03.11	Mutawintji National Park Board of Management	Pat Laughton	advised that after temporary suspension in December 2010, this project has now recommenced. Stage 2/3 letter & project detail emailed advising FW date for TL route and inviting comment on proposed methodology EOI DATE 13 April 2011	CB - email
09.03.11	Broken Hill LALC	Christine	contacted office, Joanne not in however Christine indicated that they would likely have a site officer available for the dates and she would leave a message for Joanne. In addition emailed reminder to Joanne.	
10.03.11	Broken Hill LALC	Joanne O'Donnell	spoke to Joanne, received insurances, Joanne advised they will need to send a Snr and a Jnr and that she will forward a p/o which OzArk will forward to client for approval.	
15.03.11	Mutawintji National Park Board of Management	Pat Laughton	Hi Cheryl, Thankyou for the update on the project, I will inform the Mutawintji BOM and the Mutawintji LALC and give them a hard copy of your letter 15th March and the project description. Thank you, Pat.	CB - email
FW PARTICIPATION				
24.03.11	Broken Hill LALC	Dulcie O'Donnell Raelene O'Donnell	participated in FW with Dr Jodie Benton.	
26.07.12	Broken Hill LALC	Joanne O'Donnell	Sent copy of draft report for comment, advised the Project Area has been reduced, re-survey not required. Comments due by Monday 27th August 2012.	
26.07.12	Mutawintji Board of Mgmt.	Pat Laughton	Sent copy of draft report for comment, advised the Project Area has been reduced, re-survey not required. Comments due by Monday 27th August 2012.	

COMMUNITY CONSULTATION				
26.07.12	Mutawintji LALC	Pat Laughton	Sent copy of draft report for comment, advised the Project Area has been reduced, re-survey not required. Comments due by Monday 27th August 2012.	
14.08.12	Mutawintji LALC	Pat Laughton	Hi Cheryl, The MLALC are aware of the review of the Solar Power Project and have no feedback on the draft report. Thankyou. Cheers Pat.	
15.08.12	Broken Hill LALC	Joanne O'Donnell	Left message on answer phone and emailed reminder that should BHLALC wish to comment on the report submissions due by Monday next week. phoned @ 9.30 am / 2.00 pm.	
2013				
11.6.13	Broken Hill LALC	Joanne O'Donnell	phone rang out - rang 6 times - no message bank. Enquiring re suitability of the AFGM being held 25 May 2013	Phone SB
12.6.13	Broken Hill LALC	Joanne O'Donnell	phone rang out - rang 2 times - no message bank. Enquiring re suitability of the AFGM being held 25 May 2013	Phone SB
12.6.13	Broken Hill LALC	Joanne O'Donnell	SB rang and spoke to Joanne re potential dates - Joanne requested a follow through email and would respond whether suitable. Could potentially hold it at the LALC office. Some concerns over the 25 June as it may be the week of the NSWALC state conference	Phone SB
12.6.13	Broken Hill LALC	Joanne O'Donnell	SB sent email	email SB
12.6.13	Broken Hill LALC	Joanne O'Donnell	SB rang and confirmed that we will defer the AFGM to August 2013	email SB
16.6.13	Broken Hill LALC	Joanne O'Donnell	SB rang to discuss potential dates in Aug 13 - phone rang out	
17.7.13	Broken Hill LALC	Joanne O'Donnell	SB rang to discuss potential dates in Aug 13 - phone rang out	
19.7.13	Broken Hill LALC	Joanne O'Donnell	SB rang an discussed the AFGM-potential date locked in as 15.8.13, to be held at the LALC office . Joanne to confirm with Maureen availability and then confirm with SB on Monday	phone

COMMUNITY CONSULTATION				
19.7.13	Barkandji Traditional Owners #8	Ross Mackay	SB rang and spoke to Ross MacKay, put forward the proposed date of the 15 Aug 13 for the AFGM. Ross doesn't know of any issues except there is a working party meeting on that week, believes the only one from the group that is interested in this project is Maureen. SB discussed that the LALC were looking in to her availability.	phone
25.7.13	Mutawintji National Park Board of Management	Pat Laughton	SB sent by mail and email - invitation, agenda & draft CHMP v2.1 scheduled for the 15.8.13	email/post
25.7.13	Mutawintji LALC	Pat Laughton	SB sent by mail and email - invitation, agenda & draft CHMP v2.1 scheduled for the 15.8.13	email/post
25.7.13	Broken Hill LALC	Joanne O'Donnell	SB sent by mail and email - invitation, agenda & draft CHMP v2.1 scheduled for the 15.8.13	email/post
25.7.13	Barkandji Traditional Owners #8	Ross Mackay	SB sent by mail and email - invitation, agenda & draft CHMP v2.1 scheduled for the 15.8.13	email/post
12.8.13	Broken Hill LALC	Joanne O'Donnell	Maureen rang and spoke to SB requesting a change of date for the forum. SB said doesn't think it possible but will look into	email
12.8.13	Broken Hill LALC	Joanne O'Donnell	SB sent email responding to Joanne that we are unable to change the AFGM date.	email
12.8.13	Broken Hill LALC	Joanne O'Donnell	SB spoke to Maureen O'Donnell. Maureen will be late but will try to attend if not Joanne can cover for her.	email
<p>AFGM 15th August 2013 Attendance: BH LALC: Joanne O'Donnell, Ray O'Donnell, Dulcie O'Donnell Wilyakali Elder: Maureen O'Donnell, AGL: Doug Langfear First Solar: Sean Greene, Nicole Ghitto, Gavin Randall OzArk EHM: Jodie Benton, Sheridan Baker</p>				
28.8.13	Broken Hill LALC	Joanne O'Donnell	SB emailed Joanne asking for feedback from the LALC meeting on the 26th	email
28.8.13	Broken Hill LALC	Joanne O'Donnell	SB rang and phone rang out	phone
3.9.13	Broken Hill LALC	Joanne O'Donnell	SB emailed Joanne asking for feedback from the LALC meeting on the 26th	email
3.9.13	Broken Hill LALC	Joanne O'Donnell	SB rang and left a message on answering service to call back regarding the closing of the feedback period for the reports	phone

COMMUNITY CONSULTATION				
4.9.13	Broken Hill LALC	Joanne O'Donnell	SB rang and left a message on answering service to call back regarding the closing of the feedback period for the reports and that if I didn't hear back soon we would need to consider the report as approved	phone
4.9.13	Broken Hill LALC	Joanne O'Donnell	SB - rang and spoke to Joanne at the BH LALC. Joanne was planning to take to the board at the next meeting. SB discussed that consultation phase of 28 days had ended and we really needed feedback. Joanne to drop report to board members this weekend and get feedback on Monday Morning. SB to call Joanne Monday afternoon.	phone
10.9.13	Broken Hill LALC	Joanne O'Donnell	SB - emailed Joanne at BH LALC for feed back on the Draft CHMP	email
10.9.13	Broken Hill LALC	Joanne O'Donnell	SB - rang Joanne at BH LALC for feed back on the Draft CHMP. Joanne hasn't had a chance to get the feedback as the LAC has been doing audit for the past 2 days. Joanne will contact them tonight. SB reiterated that this part of the consultation phase needs to be closed off and will need to have final answer tomorrow. SB to ring back tomorrow morning.	phone
11.9.13	Broken Hill LALC	Joanne O'Donnell	SB - rang BH LALC for feed back regarding the Draft CHMP. No answer, left a message re closing off consultation today and to please call back	phone
11.9.13	Broken Hill LALC	Joanne O'Donnell	SB -emailed Joanne at BH LALC informing that as there was no further feedback received from the LALC the report is now considered accepted	email

- General discussion around heritage management and examples given regarding the consultation and management processes.

Environmental Management

- The Construction Environmental Management Plan (CEMP) holds many smaller plans within it, and the first draft has not been distributed yet, still being formed. This plan when done, will guide the environmental management for the project.

Archaeological assessment, Traditional owners

- General recap of previous whole site survey done by Jodie Benton & Dulcie O'Donnell.
- Maureen clarified that any salvage was to include the Registered Aboriginal Parties (RAP's) – Jodie confirmed.
- Maureen raised that only Traditional Owners have the right to speak for country (not necessarily all RAPs). It is the Wilyakali language group that are the Traditional Owners in relation to the area of the Broken Solar Plant, of which the O'Donnell's are representatives.
- CEO of Broken Hill LALC (Joanne O'Donnell) is to be the point of contact on behalf of the Wilyakali people regarding this project.
- There is an MOU in place between Broken Hill LALC and the Wilyakali Aboriginal Corporation (Joanne provided this to OzArk the day following the meeting).

Other issues

- General discussion regarding potential employment for Aboriginal people. First Solar provided fliers highlighting their commitment in this area and discussed employment programmes they would bring to the attention of the LALC.

Presentation of CHMP Draft

Jodie Benton

General overview of document

- Distribution of additional one page document listing the changes made to the draft ACHMP since document receipt by the RAP's. This incorporates OEH comments on the draft ACHMP.
- Distribution of map illustrating approximate locations of Aboriginal sites within the project area.

Notable points

- The sites that have been approved for salvage are those within the impact area (white zone on map). Other sites are outside of the impact area and are to remain in their current location and be conserved.
- BHS 11 - only needs to be identified – put up temporary fencing so that it can be avoided.

- A question was asked of Jodie by Maureen regarding whether the whole area had been surveyed. Jodie clarified that whole area was surveyed previously, with Dulcie O'Donnell, in 2010 and some additional areas in 2011.
- Maureen O'Donnell noted that the salvaged artefacts should not to be taken off the Project Area. Artefacts to be placed outside the impact area but in a safe nominated place on site. Dulcie agreed.
- This will be in a location close to an identified site outside of the impact area, but within the project Area (i.e. near BHS-1, 2 or 3)

Break for lunch12-12:45

Discussion on heritage management plan

- Maureen O'Donnell clarified that if artefacts have been salvaged from the surface (as is the case for this project) then they should go back on the surface, not buried underground. Again Dulcie strongly supported this and Jodie agreed. The location will be captured with a GPS and information supplied to OEH.
- Relocated artefacts are to be kept near other sites, then each site fenced off during the construction period.
- Jodie then went on to an explanation of the Unanticipated Finds protocol and management.
- If something is found, then the determination of whether it is an artefact or not can be made by an archaeologist or a traditional owner as nominated through the Broken Hill LALC.
- Maureen O'Donnell requested inductions for workers in cultural heritage and management be done by traditional owners (Wilyakali).
- Joanne noted that the Draft ACHMP, including changes resulting from this AFGM, is to be submitted at the BH LALC meeting on 26 August 2013.
- Letter of endorsement of the draft or feedback from BH LALC is to be issued to OzArk as soon as practical after the meeting.

Meeting closed: 1:30pm

Attendance list for Broken Hill Solar Project

AFGM

15.8.13

Broken Hill LALC Office

NAME	POSITION	ORGANISATION	CONTACT NUMBER	EMAIL ADDRESS
Jodie Benton	Director/ Archaeologist	OzArk EHM	02 6882 0118 0403 763 504	jodie@ozarkehm.com.au
Sheridan Baker	Office Manager and Community Liaison	OzArk EHM	02 6882 0118	sheridan@ozarkehm.com.au
Joanne O'Donnell	CEO Broken Hill LALC	Broken Hill LALC	08 8087 7310	wwalalc@iinet.au
Sean Greene		First Solar	0419 663 217	sean.greene@firstsolar.com
Doug Langfear	Manager Power Development (Solar)	AGL	02 9921 2201 0448 816 098	dlangfear@agl.com.au
Nicole Ghiotto	Manager, Technical Sales	First Solar	0417 673 450	nicole.ghiotto@firstsolar.com
Maureen O'Donnell		Wilyakali Elder	0427 185 283	
Gavin Randall		First Solar	0410 080 764	gavin.randall@firstsolar.com
Ray O'Donnell		Broken Hill LALC	08 8087 7310	ray_bhlalc@iinet.nat.au
Dulcie O'Donnell	Sites officer	Broken Hill LALC	0456 117 817 0447 074 163	

Appendices



Appendix A – Conditions and Commitments to CEMP Map



Conditions addressed by the First Solar CEMP

Heading	Condition	Condition description	CEMP reference
Obligation to Minimise Harm to the Environment	A1	The Proponent shall implement all reasonable and feasible measures to prevent and/or minimise any harm to the environment that may result from the construction, operation or decommissioning of the Project	CEMP S1.
Terms of Approval	A2	A2. The Proponent shall carry out the project generally in accordance with the: a) Major Projects Application 10_0202; b) Broken Hill Solar Plant Environmental Assessment prepared by Sinclair Knight Merz dated October 2012; c) Broken Hill Solar Plant Submissions and Preferred Project Report prepared by Sinclair Knight Merz dated February 2013; and d) The conditions of this approval (as applicable to First Solar Scope of Work as EPC for this Project).	CEMP S3.3.
Compliance	A12	The Proponent shall ensure that employees, contractors and sub-contractors are aware of, and comply with, the conditions of this approval relevant to their respective activities.	CEMP S3.3.
Ancillary Facilities	B1	Unless otherwise approved by the Director-General, the location of Ancillary Facilities shall: a) be located more than 50 metres from a waterway; b) be located within or adjacent to the Site; c) have ready access to the road network; d) be located to minimise the need for heavy vehicles to travel through residential areas; e) be sited on relatively level land; f) be separated from nearest residences by at least 200 metres (or at least 300 metres for a temporary batching plant); g) not require vegetation clearing beyond that already required by the Project; h) not impact on heritage sites (including areas of archaeological sensitivity) beyond those already impacted by the Project; i) not unreasonably affect the land use of adjacent properties; j) be above the 20 ARI flood level unless a contingency plan to manage flooding is prepared and implemented; and k) provide sufficient area for the storage of raw materials to minimise, to the greatest extent practical, the number of deliveries required outside standard construction hours. The location of the Ancillary Facilities shall be identified in the CEMP.	CEMP S6.4.
Ancillary Facilities	B2	B2. All Ancillary Facilities shall be rehabilitated to at least their pre-construction condition, unless otherwise agreed by the Crown Lands Division of the Department of Trade and Investment.	CEMP S6.4.
Bushfire Risk	B3	The Proponent shall ensure that all project components on site are designed, constructed and operated to minimise ignition risks, provide for asset protection consistent with relevant NSW Rural Fire Services (RFS) design guidelines (Planning for Bushfire Protection 2006 and Standards for Asset Protection, Undated) and provide for necessary emergency management including appropriate fire-fighting equipment and water supplies on site to respond to a bush fire.	CEMP S16.3. AppG Agency Consultation.
Bushfire Risk	B4	Throughout the operational life of the project, the Proponent shall regularly consult with the local RFS to ensure its familiarity with the project, including the construction timetable and the final location of all infrastructures on the site. The Proponent shall comply with any reasonable request of the local RFS to reduce the risk of bushfire and to enable fast access in emergencies.	CEMP S16.3. AppG Agency Consultation.
Dangerous Goods	B5	Dangerous goods, as defined by the Australian Dangerous Goods Code, shall be stored and handled strictly in accordance with: a) all relevant Australian Standards; b) for liquids, a minimum bund volume requirement of 110% of the volume of the largest single stored volume within the bund; and c) the Environment Protection Manual for Authorised Officers: Bunding and Spill Management, technical bulletin (Environment Protection Authority, 1997). In the event of an inconsistency between the requirements listed from a) to c) above, the most stringent requirement shall prevail to the extent of the inconsistency	CEMP S14.3.2.
Dust Generation	B6	The Proponent shall construct and operate the project in a manner that minimises dust generation from the site, including wind-blown and traffic-generated dust as far as practicable. All project related activities on the site shall be undertaken with the objective of preventing visible emissions of dust from the site. Should visible dust emissions attributable to the project occur during construction and operation, the Proponent shall identify and implement all practicable dust mitigation measures, including cessation of relevant works during construction, planting ground covers, using dust suppressants as appropriate, such that emissions of visible dust cease.	CEMP S13, CEMP Sub-plan C.
Water Quality Impact	B8	Works within 40m of a watercourse are to be carried out in accordance with the Guidelines for Controlled Activities on Waterfront Land (NOW, July 2012).	CEMP S10.6.2.
Construction Soil and Water Management	B9	Soil and water management measures consistent with Managing Urban Stormwater - Soils and Construction Vol. 1 (Landcom, 2004) shall be employed during the construction of the Project to minimise soil erosion and the discharge of sediment and other pollutants to land and/or waters	CEMP S10.4.1.

Heading	Condition	Condition description	CEMP reference
Waterways	B10	Waterway crossings shall be designed and constructed in consultation with NOW and DPI (Fisheries) and consistent with DPI (Fisheries) guidelines Policy and Guidelines for Fish Friendly Waterway Crossings (2004) and Fish Passage Requirements for Waterway Crossings (2004).	CEMP S10.6.3.
Waste Management	B11	All waste materials removed from the site shall only be directed to a waste management facility or premises lawfully permitted to accept the materials	CEMP S15.3.2.
Waste Management	B12	Waste generated outside the site shall not be received at the site for storage, treatment, processing, reprocessing, or disposal on the site, except as expressly permitted by a licence under the Protection of the Environment Operations Act 1997, if such a licence is required in relation to that waste	CEMP S15.3.3.
Waste Management	B13	All liquid and/or non-liquid waste generated on the site shall be assessed and classified in accordance with Waste Classification Guidelines (Department of Environment, Climate Change and Water, 2009), or any superseding document	CEMP S15.3.2.
Utilities and Services	B14	Utilities, services and other infrastructure potentially affected by construction and operation shall be identified prior to construction to determine requirements for access to, diversion, protection, and/or support. Consultation with the relevant owner and/or provider of services that are likely to be affected by the Project shall be undertaken to make suitable arrangements for access to, diversion, protection, and/or support of the affected infrastructure as required. The cost of any such arrangements shall be borne by the Proponent.	CEMP S6.6.
Native Vegetation Impacts	B15	The clearing of all native vegetation is to be limited to the minimal extent practicably required. Details regarding the procedures for clearing vegetation and minimising the extent of clearing shall be clearly included in the Flora and Fauna Management Plan contained in condition C3(a)	CEMP Sub-plan A. S4.1.4.
Native Vegetation Impacts	B16	Tree trunks and major branches from cleared trees should be used, to the fullest extent practicable, to enhance habitat (coarse woody debris) in rehabilitated areas or in native shrub lands (either in offset areas or areas adjoining impacted areas) and included in the Construction Flora and Fauna Management Plan contained in condition C3(a)	CEMP Sub-plan A. S4.1.7.
Fauna Impacts	B18	Prior to construction the Proponent shall prepare, in consultation with a suitably qualified expert, and implement a management plan for the raptor nesting site described in Figure 7-3 of the Environmental Assessment. This plan shall include, but not be limited to: (a) an assessment of the foraging, breeding and habitat available to the raptor populations, including a map of the suitable breeding, roosting and foraging habitat on the project site; (b) identified protection measures for this habitat; (c) a protocol for checking available breeding habitat prior to any construction works being undertaken, with suitable protection measures implemented if nests are identified; (d) identified measures to minimise impact and disturbance to raptors during construction and operation; (e) a monitoring program to assess and respond to impacts on the local raptor populations by construction and operations on the project site; and (f) if monitoring results demonstrate the nest has been abandoned then further mitigation, such as a provision of an artificial structure to allow a new nest to be built in the offset area should be investigated. A copy of the Plan shall be provided to the Department and the OEH prior to the commencement of construction	The findings of this plan are included in CEMP Sub-plan A S4.1.9.
Fauna Impacts	B19	During construction, the Proponent shall maintain a buffer of 500 metres in all directions from the raptor nesting site described in Figure 7-3 of the Environmental Assessment unless otherwise agreed to by the Director-General. Note: it is understood that approval for a reduced buffer has been received as described in Sub-plan A.	CEMP Sub-plan A S4.1.9.
Rehabilitation and Revegetation	B23	The Proponent shall implement a revegetation and rehabilitation program for all areas of the project footprint which are disturbed during the construction of the project but which are not required for the ongoing operation of the project including temporary construction facility sites and sections of construction access roads. The Proponent shall ensure that all revegetation measures are implemented progressively where possible and in all cases within six months of the cessation of construction activities at the relevant area. Unless otherwise agreed to by the Director-General, the Proponent shall monitor and maintain the health of all revegetated areas until such time that the plantings have been verified by an independent and suitably qualified expert (whose appointment has been agreed to by the Director-General) as being well established, in good health and self sustaining.	CEMP S11.4.2, S11.8.
Construction Noise	B24	Construction activities associated with the project shall be undertaken during the following standard construction hours: (a) 7:00am to 6:00pm Mondays to Fridays, inclusive; (b) 8:00am to 1:00pm Saturdays; and (c) at no time on Sundays or public holidays.	CEMP Sub-plan D S2.3.

Heading	Condition	Condition description	CEMP reference
Construction Noise	B25	Construction works outside of the standard construction hours identified in condition B24 may be undertaken in the following circumstances: (a) construction works that generate noise that is: (i) no more than 5 dB(A) above rating background level at any residence in accordance with the Interim Construction Noise Guideline (Department of Environment and Climate Change, 2009); and (ii) no more than the noise management levels specified in Table 3 of the Interim Construction Noise Guideline (Department of Environment and Climate Change, 2009) at other sensitive receivers; or (b) for the delivery of materials required outside those hours by the NSW Police Force or other authorities for safety reasons; or (c) where it is required in an emergency to avoid the loss of life, property and/or to prevent environmental harm; (d) works as approved through the out-of-hours work protocol outlined in the Construction Noise Management Plan required under condition C3(d).	CEMP Sub-plan D S2.3.
Construction Noise	B26	Any activities resulting in impulsive or tonal noise emission (such as rock breaking, rock hammering, pile driving) shall only be undertaken: (a) between the hours of 8:00 am to 5:00 pm Mondays to Fridays; (b) between the hours of 8:00 am to 1:00 pm Saturdays; and (c) in continuous blocks not exceeding three hours each with a minimum respite from those activities and works of not less than one hour between each block. For the purposes of this condition, 'continuous' includes any period during which there is less than a one hour respite between ceasing and recommencing any of the work the subject of this condition.	CEMP Sub-plan D S3.2.
Construction Noise	B27	The Proponent shall implement all reasonable and feasible measures to minimise noise generation from the construction of the project consistent with the requirements of the Interim Construction Noise Guideline (DECC, July 2009) including noise generated by heavy vehicle haulage and other construction traffic associated with the project	CEMP Sub-plan D S1.
Heritage Impacts	B32	If during the course of construction the Proponent becomes aware of any previously unidentified Aboriginal object(s), all work likely to affect the object(s) shall cease immediately and the OEH informed in accordance with the National Parks and Wildlife Act 1974. In addition, registered Aboriginal stakeholders shall be informed of the finds. Works shall not recommence until an appropriate strategy for managing the objects has been determined in consultation with the OEH and the registered Aboriginal stakeholders and written authorisation from the OEH is received by the Proponent.	CEMP Sub-plan F.
Heritage Impacts	B33	If during the course of construction the Proponent becomes aware of any unexpected historical relic(s), all work likely to affect the relic(s) shall cease immediately and the Heritage Office notified in accordance with the Heritage Act 1977. Works shall not recommence until the Proponent receives written authorisation from the Heritage Office.	CEMP S12, S12.3.1.
Environmental Representative	C1	C1. Prior to the commencement of construction of the Project, or as otherwise agreed by the Director-General, the Proponent shall nominate for the approval of the Director-General a suitably qualified and experienced Environment Representative(s) that is independent of the design and construction personnel. The Proponent shall employ the Environmental Representative(s) for the duration of construction, or as otherwise agreed by the Director - General. The Environmental Representative(s) shall: a) be the principal point of advice in relation to the environmental performance of the Project; b) monitor the implementation of environmental management plans and monitoring programs required under this approval and advise the Proponent upon the achievement of these plans/ programs; c) have responsibility for considering and advising the Proponent on matters specified in the conditions of this approval, and other licences and approvals related to the environmental performance and impacts of the Project; d) ensure that environmental auditing is undertaken in accordance with the Proponent's Environmental Management System(s); e) be given the authority to approve/ reject minor amendments to the Construction Environmental Management Plan. What constitutes a "minor" amendment shall be clearly explained in the Construction Environment Management Plan required under Condition C2; f) be given the authority and independence to require reasonable steps be taken to avoid or minimise unintended or adverse environmental impacts, and failing the effectiveness of such steps, to direct that relevant actions be ceased immediately should an adverse impact on the environment be likely to occur; and g) be consulted in responding to the community concerning the environmental performance of the Project where the resolution of points of conflict between the Proponent and the community is required.	CEMP 8.2.2.
Construction Environmental Management Plan (CEMP)	C2.a	a description of all relevant activities to be undertaken on the site during construction including an indication of stages of construction, where relevant;	CEMP S6.3.
Construction Environmental Management Plan (CEMP)	C2.b	identification of the potential for cumulative impacts with other construction activities occurring in the vicinity and how such impacts would be managed;	CEMP S7.

Heading	Condition	Condition description	CEMP reference
Construction Environmental Management Plan (CEMP)	C2.c	details of any construction sites and mitigation, monitoring, management and rehabilitation measures specific to the site compound(s) that would be implemented;	CEMP S6.3, S10-16, Sub-plans A-F.
Construction Environmental Management Plan (CEMP)	C2.d	statutory and other obligations that the Proponent is required to fulfil during construction including all relevant approvals, consultations and agreements required from authorities and other stakeholders, and key legislation and policies;	CEMP S5.3.
Construction Environmental Management Plan (CEMP)	C2.e	evidence of consultation with relevant public authorities required under this condition and how issues raised by the agencies have been addressed in the plan;	CEMP S19, Appendix F Agency Consultation.
Construction Environmental Management Plan (CEMP)	C2.f	a description of the roles and responsibilities for all relevant employees involved in the construction of the project including relevant training and induction provisions for ensuring that all employees, contractors and sub-contractors are aware of their environmental and compliance obligations under these conditions of approval	CEMP S8, S10-16, Appendix B Worker Awareness and Compliance Training.
Construction Environmental Management Plan (CEMP)	C2.g	details of how the environmental performance of construction will be monitored, and what actions will be taken to address identified potential adverse environmental impacts;	CEMP S10-16, Sub-plans A to F.
Construction Environmental Management Plan (CEMP)	C2.h	specific consideration of relevant measures identified in the documents referred to under conditions A2b) and A2c) of this approval;	CEMP S5.2, S9.
Construction Environmental Management Plan (CEMP)	C2.i	the additional requirements of this approval;	CEMP S5.2, S9.
Construction Environmental Management Plan (CEMP)	C2.j	a complaints handling procedure during construction identified in conditions C12 and C14;	CEMP S21.
Construction Environmental Management Plan (CEMP)	C2.k	register of construction work hazards and the anticipated level of risk associated with each;	Appendix C Register of Construction Hazards and Environmental Risk Assessment.
Construction Environmental Management Plan (CEMP)	C2.l	measures to monitor and manage soil and water impacts in consultation with NOW including: control measures for works close to or involving waterway crossings (including rehabilitation measures following disturbance and monitoring measures and completion criteria to determine rehabilitation success), identification of construction activities that are likely to pose a risk of groundwater interference, and procedures for managing groundwater impacts should they occur;	CEMP S10.
Construction Environmental Management Plan (CEMP)	C2.m	measures to monitor and manage flood impacts in consultation with NOW;	CEMP S9.2.2.
Construction Environmental Management Plan (CEMP)	C2.n	measures to monitor and manage dust emissions including dust generated by traffic on unsealed public roads and unsealed internal access tracks;	CEMP S13.
Construction Environmental Management Plan (CEMP)	C2.o	emergency management measures including measures to control bushfires; and	CEMP S8.5, 14.4, S16.7, 20.5.3.
Construction Environmental Management Plan (CEMP)	C2.p	information on water sources	CEMP S6.5.
Construction Environmental Management Plan (CEMP)	C3.a	Flora and Fauna Management Plan, developed in consultation with the OEH, to outline measures to protect and minimise loss of native vegetation and native fauna habitat as a result of construction of the project. The Plan shall include, but not necessarily be limited to:	CEMP Sub-plan A.
		(i) plans showing terrestrial vegetation communities; important flora and fauna habitat areas; locations of EECs, native pasture; and areas to be cleared. The plans shall also identify vegetation adjoining the site where this contains important habitat areas and/or threatened species, populations or ecological communities	CEMP Sub-plan A. S3 Flora and Fauna Plans.
		(ii) methods to manage impacts on flora and fauna species and their habitat which may be directly or indirectly affected by the project, such as location of fencing, procedures for vegetation clearing or soil removal/stockpiling and procedures for re-locating hollows or installing nesting boxes and managing weeds	CEMP Sub-plan A. S4 Management Measures.
		(iii) procedures to accurately determine the total area, type and condition of vegetation community to be cleared	CEMP Sub-plan A. S4.1.2 Pre-clearance surveys.
		(iv) reference to the Ground Cover Management Plan and the Management Plan for the raptor nesting site required in condition C3(b) and B18 respectively	CEMP Sub-plan A. S2 Relationship to other Plans and CEMP Sub-plans.
		(v) a procedure to review management methods where they are found to be ineffective.	CEMP Sub-plan A. S5 Monitoring effectiveness of management actions.
Construction Environmental Management Plan (CEMP)	C3.b	a Ground Cover Management Plan, developed in consultation with the Crown Lands Division of the Department of Trade and Investment an agronomist, to outline measures to ensure adequate vegetation cover and composition beneath the solar PV array. The Plan shall include, but not necessarily be limited to:	CEMP Sub-plan B.

Heading	Condition	Condition description	CEMP reference
		(i) procedures to minimise disturbance to ground cover not impacted by the project particularly in the area of the native shrubland in good condition;	S5.1 Minimisation of ground cover disturbance.
		(ii) procedures for the stabilisation, rehabilitation and revegetation of disturbed ground cover including reference to field trials where required;	S5.3 Temporary stabilisation works. S5.4 Establishment and stabilisation of ground cover.
		(iii) weed management measures to control and prevent the spread of noxious weeds;	S6 Weed management measures.
		(iv) monitoring methods to assess the impact of the project on the ground cover vegetation;	S7 Monitoring of development impact on ground cover.
		(v) a procedure to review management methods where they are found to be ineffective.	S8 Review and corrective actions.
Construction Environmental Management Plan (CEMP)	C3.c	a Landscape Plan, to minimise visual impacts from the solar plant. . The Plan shall include, but not necessarily be limited to:	CEMP Sub-plan C.
		(i) identification of landscaping objectives and standards based on visual impacts and local environmental values (in particular the Pinnacles);	S2 Landscape values.
		(ii) details of species used to enhance, mitigate and/or augment landscaping to minimise the visual impact of the project, particularly with respect to the impacts on nearby residences;	S3 Landscape species.
		(iii) implementation, management and monitoring strategies to ensure the establishment and ongoing maintenance of landscaped areas;	S4 Implementation of landscape planting.
		(iv) a consultation strategy to seek feedback from affected residents and the interested community on the proposed landscape measures.	S7 Community consultation.
Construction Environmental Management Plan (CEMP)	C3.d	a Construction Noise Management Plan to manage noise impacts during construction and to identify all feasible and reasonable noise mitigation measures. The Plan shall include, but not necessarily be limited to:	CEMP Sub-plan D.
		(i) details of construction activities and an indicative schedule for construction works;	S2 Construction activities.
		(ii) identification of construction activities that have the potential to generate noise impacts on surrounding land uses, particularly residential areas;	S2.1 Construction noise generating activities.
		(iii) detail the requirements for Noise Impact Statement(s) for discrete work areas, including construction site compounds;	S3 Construction noise assessment (Environmental Assessment and monitoring undertaken at Nyngan).
		(iv) detail what reasonable and feasible actions and measures would be implemented to minimise noise impacts;	S4 Construction noise management and mitigation measures.
		(v) procedures for notifying sensitive receivers of construction activities that are likely to affect their noise amenity, as well as procedures for dealing with and responding to noise complaints;	S6.1 Community consultation and 6.2 Complaints management.
		(vi) an out-of-hours work (OOHW) protocol for the assessment, management and approval of works outside of standard construction hours as defined in condition B25 of this approval, including a risk assessment process under which an Environmental Representative may approve out-of- hour construction activities deemed to be of low environmental risk and refer high risk works for the Director General's approval. The OOHW protocol shall detail standard assessment, mitigation and notification requirements for high and low risk out-of-hour works, and detail a standard protocol for referring applications to the Director-General; and	S4.4 Out of Hours work protocol.
		(vii) a description of how the effectiveness of these actions and measures would be monitored during the proposed works, clearly indicating how often this monitoring would be conducted, the locations where monitoring would take place, how the results of this monitoring would be recorded and reported; and, if any exceedance is detected how any non-compliance would be rectified.	S5 Construction noise compliance monitoring.
Construction Environmental Management Plan (CEMP)	C3.e	a Traffic Management Plan to manage traffic conflicts that may be generated during construction in preparing the Plan, the Proponent shall consult with the Council, RMS and the Crown Lands Division of the Department of Trade and Investment . The Plan shall address the requirements of the relevant road authority and shall include, but not necessarily be limited to:	CEMP Sub-plan E.
		(i) details of how construction of the project will be managed in proximity to local and regional roads;	S4.1 Management and coordination of vehicles.
		(ii) details of traffic routes for heavy vehicles, including any necessary route or timing restriction for oversized loads;	S3.2 Access roads to site. S 4.4.4 Restricted vehicle access.
		(iii) demonstration that all statutory responsibilities with regard to road traffic impacts have been complied with;	S4.3 Statutory responsibilities.
		(iv) details of measures to minimise interactions between the project and other users of the roads such as the use of fencing, lights, barriers, traffic diversions etc;	S4.4 General measures to minimise interactions.
		(v) procedures for informing the public where any road access will be restricted as a result of the project;	S4.4.4 Restricted vehicle access.
		(vi) procedures to manage construction traffic to ensure the safety of livestock and to minimise disruption to livestock;	S4.4.2 Livestock safety.
		(vii) speed limits to be observed along routes to and from the site and within the site; and	S4.2 Driver code of conduct and site inductions.

Heading	Condition	Condition description	CEMP reference
		(viii) details of the expected behavioural requirements for vehicle drivers travelling to and from the site and within the site.	S4.2.2 General requirements.
Construction Environmental Management Plan (CEMP)	C3.f	an Aboriginal Heritage Plan to monitor and manage Aboriginal heritage shall be developed in consultation with the OEH and registered Aboriginal stakeholders, and include the following:	CEMP Sub-plan F. OzArk Environmental and Heritage Management (2013) <i>Documentation of actions in relation to the Aboriginal Cultural Heritage Management Plan for AGL Energy Limited (AGL)</i> , Broken Hill Solar Plant (December, 2013)
		(i) details of further archaeological investigations and/or salvage measures to be carried out prior to construction;	S4 The Aboriginal Heritage Resource.
		(ii) procedures for the management of identified objects within the project site;	S5.1 Specific management for impacted sites.
		(iii) procedures for dealing with unidentified objects and/or human remains;	S5.4.1 Unanticipated finds protocol.
		(iv) Aboriginal cultural heritage induction processes for construction personnel; and	S5.4.2 Aboriginal heritage inductions for work.
		(v) Procedures for ongoing Aboriginal consultation and involvement.	S2.3 Protocol for continued Aboriginal community consultation.
Incident Reporting	C8	The Proponent shall notify, at the earliest opportunity, the Director-General and any other relevant agencies of any incident that has caused, or threatens to cause, material harm to the environment. For any other incident associated with the project, the Proponent shall notify the Director- General and any other relevant agencies as soon as practicable after the Proponent becomes aware of the incident. Within 7 days of the date of the incident, the Proponent shall provide the Director-General and any relevant agencies with a detailed report on the incident, and such further reports as may be requested	CEMP S8.5, S20.5.1.
Regular Reporting	C9	The Proponent shall provide regular reporting on the environmental performance of the project on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this approval.	CEMP S17.3.1, 20.1.
Community Information, Consultation and Involvement	C10	Subject to reasonable confidentiality requirements, the Proponent shall make all documents required under this approval available for public inspection on request.	CEMP S17.3.1.
Provision of Electronic Information	C11	Prior to the commencement of construction, the Proponent shall establish a dedicated website or maintain dedicated pages within its existing website for the provision of electronic information associated with the project. The Proponent shall publish and maintain up-to-date information on this website or dedicated pages including, but not necessarily limited to: (a) the status of the project; (b) a copy of this approval and any future modification to this approval; (c) a copy of each relevant environmental approval, licence or permit required and obtained in relation to the project; (d) a copy of each plan, report, or monitoring program required by this approval; and (e) details of the outcomes of compliance reviews and audits of the project.	CEMP S17.3.1.
Community Information Plan	C12.a	procedures to inform the local community of planned investigations and construction activities, including blasting works (if any)	CEMP S17.3.2.
Community Information Plan	C12.b	procedures to inform the relevant community of construction traffic routes and any potential disruptions to traffic flows and amenity impacts	CEMP S17.3.2.
Community Information Plan	C12.c	procedures to consult with local landowners/residents with regard to construction traffic to ensure the safety of livestock and to limit disruption to livestock movements	CEMP S17.3.2.
Community Information Plan	C12.d	procedures to inform the community where work outside the construction hours specified in condition B25, in particular noisy activities, has been approved	CEMP S17.3.2.
Community Information Plan	C12.e	procedures to inform and consult with the Crown Lands Division of the Department of Trade and Investment to rehabilitate impacted land	CEMP S17.3.2.

Other Conditions		
Heading	Condition	Response
Terms of Approval	A3	Only as applicable to First Solar Scope of Work as EPC for the Solar PV Power Station
Terms of Approval	A4	Only as applicable to First Solar Scope of Work as EPC for the Solar PV Power Station
Limits of Approval	A5	Only as applicable to First Solar Scope of Work as EPC for the Solar PV Power Station
Staging	A6	Only as applicable to First Solar Scope of Work as EPC for the Solar PV Power Station
Structural Adequacy	A7	Only as applicable to First Solar Scope of Work as EPC for the Solar PV Power Station
Decommissioning	A8	Not in First Solar Scope of Work as EPC for the Solar PV Power Station
Decommissioning	A9	Not in First Solar Scope of Work as EPC for the Solar PV Power Station
Not named in Instrument of Approval	A10	Item number not included

Heading	Condition	Condition description	CEMP reference
Decommissioning	A11	Not in First Solar Scope of Work as EPC for the Solar PV Power Station	
Compliance	A13	Only as applicable to First Solar Scope of Work as EPC for the Solar PV Power Station	
Compliance	A14	Only as applicable to First Solar Scope of Work as EPC for the Solar PV Power Station	
Water Quality Impact	B7	Only as applicable to First Solar Scope of Work as EPC for the Solar PV Power Station	
Waterways	B10	Only as applicable to First Solar Scope of Work as EPC for the Solar PV Power Station	
Fauna Impacts	B17	Not in First Solar Scope of Work as EPC for the Solar PV Power Station	
Landscaping Requirements	B20	Not in First Solar Scope of Work as EPC for the Solar PV Power Station	
Landscaping Requirements	B21	Not in First Solar Scope of Work as EPC for the Solar PV Power Station	
Landscaping Requirements	B22	Not in First Solar Scope of Work as EPC for the Solar PV Power Station	
Operational Noise Criteria	B28	Not in First Solar Scope of Work as EPC for the Solar PV Power Station	
Operational Noise Design Standards - Overhead Transmission Line	B29	Not in First Solar Scope of Work as EPC for the Solar PV Power Station	
Road Dilapidation	B30	Not in First Solar Scope of Work as EPC for the Solar PV Power Station	
Road Dilapidation	B31	Not in First Solar Scope of Work as EPC for the Solar PV Power Station	
Operational Environmental Management Plan	C4	Not in First Solar Scope of Work as EPC for the Solar PV Power Station	
Biodiversity Offset Management Plan	C5	Not in First Solar Scope of Work as EPC for the Solar PV Power Station (The Biodiversity Offset Management Plan was prepared by a third party on behalf of the Proponent)	
Decommissioning Management Plan	C6	Not in First Solar Scope of Work as EPC for the Solar PV Power Station	
Decommissioning Road Dilapidation	C7	Not in First Solar Scope of Work as EPC for the Solar PV Power Station	
Complaints Procedure	C13	Only as applicable to First Solar Scope of Work as EPC for the Solar PV Power Station	
Complaints Procedure	C14	Only as applicable to First Solar Scope of Work as EPC for the Solar PV Power Station	
Complaints Procedure	C15	Only as applicable to First Solar Scope of Work as EPC for the Solar PV Power Station	
Compliance Tracking Program	C16	Only as applicable to First Solar Scope of Work as EPC for the Solar PV Power Station	

Commitments addressed by the First Solar CEMP

Objective	Reference	Commitment	Project phase	Section where Commitment Addressed
Environmental management				
Compliance and continuous improvement in environmental management	EM1	The head contractor for the project will have an environmental management system, including a performance and compliance auditing program.	Construction	CEMP (overall); Performance and Compliance: CEMP S20
Minimise impact of construction and operation on surrounding area	EM2	A Construction Environmental Management Plan (CEMP) will be prepared and implemented before the start of any construction activities. The CEMP will include details on the Aboriginal Heritage Management Plan, which will be finalised and implemented prior to the commencement of construction of the solar plant.	Pre-construction & construction	CEMP (overall), including CEMP Sub-plan F
	EM3	A CEMP and an Operation Environmental Management Plan (OEMP) will be prepared for the site in consultation with the relevant authorities including the NSW Office of Water, OEH and RMS.	Pre-construction, construction & operation	CEMP (overall)
Community consultation				
Stakeholders and the community are kept well informed about the project	CC1	A community consultation plan will be prepared and implemented. The plan will include a project phone number, e-mail and website for community input, a complaints handling procedure, and procedures for targeted consultation with affected stakeholders.	Pre-construction & construction	CEMP S17
Visual impacts				
Minimise potential for adverse visual impacts during construction	V1	Vegetation removal will be avoided as far as practicable during construction. Any native vegetation near the outside edge of the solar PV plant site boundary will be cordoned off to minimise the risk of accidental disturbance.	Construction	CEMP Sub-plan B S5.1
	V2	Vehicles will remain on designated paths during construction to avoid degradation of the landscape.	Construction	CEMP Sub-plan B S5.1
	V3	Construction equipment and infrastructure will be demobilised from site as soon as practicable and all unnecessary project flagging and signage will be removed and disposed of at the completion of construction.	Construction	CEMP Sub-plan C S5
Minimise long-term visual impacts on the landscape	V4	Plantings of locally indigenous, shrubby vegetation will be provided along the north eastern and part of the north western boundary of the solar PV plant site to mitigate the visual impacts on views to The Pinnacles from the Barrier Highway, Silverton Road and Magazine Way. Plant species will be selected so as not to block views of The Pinnacles.	Construction & operation	CEMP Sub-plan C S3.3
	V5	Access tracks will be constructed of locally sourced gravel (to the extent required) that matches the colour of the existing site surface as far as practicable.	Construction & operation	CEMP Sub-plan C S5
	V6	Underground cabling will be used where practical. The colour of aboveground ancillary electrical equipment associated with the solar PV plant will be selected to best integrate with the surrounding landscape, with preference given to earthy tones such as pale green and pale brown.	Pre-construction, construction & operation	CEMP Sub-plan C S5
Minimise potential glare impacts	V7	In the event that glare from the solar plant is evident from a public road and causes a nuisance, distraction and/or hazard to motorists, the proponent shall immediately implement further glare mitigation measures.	Construction & operation	CEMP Sub-plan C S5
Noise impacts				
Minimise potential construction noise impacts on sensitive receivers	N1	Although construction noise impacts are unlikely, identified sensitive receivers in the vicinity of the project site are to be given adequate prior notice of the construction program, kept informed throughout the construction period, and provided with a name and contact number for construction noise information and complaints. Any noise complaints will be dealt with through the standard complaints management procedure identified in the community consultation plan.	Construction	CEMP Sub-plan D S6.2
	N2	Construction noise and vibration will be minimised as far as practical through the implementation of all feasible and reasonable measures. These measures will be specified within a Construction Noise and Vibration Management Plan (CNVMP). The CNVMP will also include project-specific objectives and protocols for management of construction noise.	Construction	CEMP Sub-plan D S4
	N3	Construction activities will take place during standard working hours (7.00am to 6.00pm Monday to Friday, 8.00am to 1.00pm Saturday and no work on Sunday or public holidays). Any work outside of these hours will be undertaken in accordance with the Interim Construction Noise Guideline (OEH, 2009). The CNVMP will specify protocols for notification of potentially affected receivers for out-of-hours work.	Construction	CEMP Sub-plan D S4.4
	N4	Where feasible, the proponent will conduct noisy construction activities in consultation with sensitive receivers.	Construction	CEMP Sub-plan D S6.2
	N5	Construction equipment and methodologies will be selected in consideration of the need to minimise noise levels where feasible and reasonable.	Construction	CEMP Sub-plan D S4
Flora and fauna				
Minimise clearing of native vegetation and habitat	FF1	Clearing of native vegetation will be restricted to the minimum area necessary for construction. Clearing boundaries will be specified within the CEMP and delineated on site with appropriate boundary or exclusion fencing.	Pre-construction & construction	CEMP Sub-plan A S4.1.4
Minimise potential impacts on fauna during construction	FF2	Vehicle speed limits will be enforced along internal access roads to minimise the incidence of wildlife mortality from construction and operation vehicles.	Construction & operation	CEMP Sub-plan A
	FF3	A buffer zone of 500 metres in radius will be placed around the raptor nest site should it still be present at time of construction. No construction vehicles or personnel will enter this restricted area unless assessing the presence of this species.	Construction	CEMP Sub-plan A S4.1.9
	FF4	The CEMP and the OEMP will include monitoring requirements for the raptor nest located near to the project site. The monitoring requirements will be prepared in consultation with OEH.	Construction	CEMP Sub-plan A S4.1.9
	FF5	The site CEMP will specify management procedures for vegetation clearing and details for an ecologist to undertake a pre-clearing survey and to be present during all clearing activities.	Construction	CEMP Sub-plan A S4.1.2 and S4.1.3
	FF6	Appropriate waste management practices will be followed to prevent attracting or encouraging feral animals to the site during the construction period.	Construction	CEMP Sub-plan A S4.1.14
Restore and re-vegetate the project site as far as practical to enhance its habitat value and prevent long term degradation	FF7	Degraded portions of the site outside of the impact footprint will be restored to the extent required to a) reduce the potential for wind erosion, b) improve opportunities for fauna habitation and movement across the landscape, and c) reduce the risk of weed invasion.	Construction & operation	CEMP S11.7
	FF8	Site restoration and re-vegetation activities will be undertaken during and after construction. All re-vegetation activities will be undertaken using locally endemic native species.	Construction & operation	CEMP S11.4.3
	FF9	Appropriate weed management strategies will be implemented during construction and operation.	Construction & operation	CEMP Sub-plan B S6

Objective	Reference	Commitment	Project phase	Section where Commitment Addressed
	FF10	An Offset Management Strategy will be developed, including an Offset Management and Rehabilitation Plan, in consultation with OEH. The Strategy is to include: <ul style="list-style-type: none"> ▪ Details on the area of the offset. ▪ Vegetation communities present and their current condition. ▪ Tenure of the land within the offset. ▪ Identification of a mechanism that protects the area in perpetuity. ▪ Identification and costing of management issues, including fencing and weed/feral animal control. ▪ Monitoring details to determine the effectiveness of the management actions. The Offset Management Strategy will be prepared in consultation with the agencies responsible for the management of the Willyama Common and will consider the cumulative impacts of clearing in the Willyama Common for the transmission line. 	Pre-construction	CEMP Sub-plan A S2.1
Aboriginal heritage				
Manage impacts on known Aboriginal artefacts recorded within the project site	IH1	The proponent will consult with Aboriginal stakeholders regarding management of the 14 Aboriginal heritage sites recorded during the site survey. An Aboriginal Heritage Management Plan (AHMP) will be developed in consultation with these stakeholders and OEH to specify how the sites will be protected in-situ, relocated or salvaged.	Pre-construction & construction	CEMP Sub-plan F S2 and S3
Minimise impacts on any previously unidentified Aboriginal heritage sites and objects	IH2	Protocols will be developed to manage and protect Aboriginal artefacts or suspected human remains which may be encountered during construction. These protocols will be specified in the AHMP and may include stopping works in the vicinity of the find, notification of relevant stakeholders and implementation of an appropriate management strategy.	Pre-construction & construction	CEMP Sub-plan F S5.4.1
	IH3	All construction personnel will receive training in the management of Aboriginal artefacts and objects, including legal obligations, the application of protocols, and the recognition of artefacts.	Construction	CEMP Sub-plan F S5.4.2
Traffic and transport				
Provide safe access to the project site from the Barrier Highway	TT1	The proponent or its contractor will determine the final details of haulage during detailed transport planning, in consultation with RMS. Road and intersection works will be approved and completed prior to the commencement of construction of the solar plant, and will be at no cost to RMS.	Pre-construction	CEMP Sub-plan E S2.3
	TT2	The existing site access road off the Barrier Highway and the associated intersection will be upgraded in accordance with RMS standards to accommodate construction traffic and on-going maintenance access.	Pre-construction	Not in First Solar Scope of Work as EPC for this Project
Minimise impacts on users of local roads and the Barrier Highway during construction	TT3	A Traffic Management Plan will be prepared and implemented for the construction, operation and decommissioning phases of the project. The plan will specify: <ul style="list-style-type: none"> ▪ Travel routes and parking areas for construction and operations traffic. ▪ Origin, number, size and frequency of vehicles accessing/exiting the site. ▪ Speed limits and directions of travel on the access roads within the site. ▪ Loads, weights and lengths of haulage and construction related vehicles. ▪ Scheduling of haulage vehicle movements to minimise convoy length and platoons. ▪ Traffic control requirements, including requirements for signage, barriers and traffic control personnel. ▪ The management and coordination of vehicle movements to the site and measures to limit disruption to other motorists, emergency vehicles and school bus timetables. ▪ Details of intersection improvement works in accordance with Austroads Guide to Road Design 2010 and RMS supplements. 	Pre-construction & construction	CEMP Sub-plan E S2.3
Manage and rectify any impacts on road infrastructure	TT4	A road condition survey will be undertaken before construction to determine the potential impacts on the structural integrity of road infrastructure. The proponent will prepare a Traffic Management Plan in consultation with Broken Hill City Council and the RMS. This plan will set out the requirements for road management and monitoring.	Pre-construction & construction	Not in First Solar Scope of Work as EPC for this Project
Hazards and risks				
Minimise risk of exposure to EMFs	HR1	The proposed transmission line route has been selected to avoid EMF impacts on sensitive receivers.	Pre-construction	Not in First Solar Scope of Work as EPC for this Project
Minimise bushfire risks	HR2	An appropriate Asset Protection Zone will be maintained around the solar PV plant and transmission line.	Construction & operation	Not in First Solar Scope of Work as EPC for this Project
Minimise risks associated with use and storage of chemicals during construction	HR3	Any dangerous goods or hazardous materials kept at the construction site will be stored in a securely bunded area of sufficient containment capacity.	Construction & operation	CEMP S14.3.2
	HR4	Where dangerous goods or hazardous materials are to be stored on the construction site, an effective spill kit will be available for use at all times. Any accidental spills will be contained and cleaned up immediately.	Construction	CEMP S14.4.1
	HR5	Major plant and equipment will be refuelled either off site or by a mobile mini-fuel tanker with a spill procedure and spill kit.	Construction	CEMP S14.3.3
	HR6	Transport of dangerous goods or hazardous materials will be undertaken by an appropriately licensed contractor.	Construction	CEMP S14.3.1
	HR7	The proponent will develop a Risk Register to identify potential incidents that may occur during construction and the appropriate mitigation measures.	Pre-construction & construction	CEMP S9.1
Water management (water supply, water quality and waterways)				
Minimise potential for soil erosion and off-site transport of eroded sediments to waterways	WM1	Appropriate erosion and sediment control measures, consistent with the guidelines of the 'Blue Book' (Landcom. 2006) will be established before any clearing, excavation or ground disturbance begins and will be maintained in effective working order until the works have been completed and the affected ground surfaces stabilised.	Construction	CEMP S10.5.5
	WM2	The area of soil exposure/ disturbance will be kept to the minimum amount necessary.	Construction	CEMP S10.5.1
	WM3	Stockpiles of spoil, fill or erodible material will not be placed in or near watercourses or drainage lines.	Construction	CEMP S10.5.3
	WM4	Construction traffic will be confined to existing established roads and access tracks. During construction, the site access junction with the Barrier Highway will be monitored for build up of soil or debris. Any soil or debris tracked onto the road will be removed at the end of each work day and disposed of appropriately.	Construction	CEMP S10.5.1

Objective	Reference	Commitment	Project phase	Section where Commitment Addressed
	WM5	Disturbed surfaces will be stabilised and restored as soon as possible using appropriate stabilisation and re-vegetation measures. The plants used for site restoration will comprise native species endemic to the project site and suitable for the site conditions, taking into account soils, climate and shading.	Construction	CEMP S10.5.4
Minimise risks associated with use of chemicals during construction	WM6	To avoid accidental contamination of receiving waterways with chemicals or fuels, the commitments identified for <i>Hazards and risks</i> (above) will be adhered to.	Construction	CEMP S14
Land use				
Minimise general land use impacts	L1	Nearby landowners or leaseholders will be informed of the construction schedule and scope of works prior to construction.	Pre-construction	To be undertaken by Proponent
	L2	The NSW Department of Primary Industries and the affected leaseholder will be consulted regarding alteration of the lease conditions at the site.	Pre-construction	To be undertaken by Proponent
	L3	Easements and associated land use restrictions will be identified on property titles.	Pre-construction	To be undertaken by Proponent
	L4	Access to properties surrounding the construction site will not be impeded by construction activities.	Construction	To be undertaken by Proponent
Minimise impacts on future mining exploration	L5	The proponent will consult with current mining exploration and extraction licence and lease holders.	Pre-construction	To be undertaken by Proponent
Non-Indigenous heritage				
Minimise impacts on any previously unidentified non- Indigenous heritage items	H1	Protocols will be developed to manage and protect artefacts or suspected human remains which may be encountered during construction. The protocols may, as required, include stopping all works in the vicinity of the find, notification of relevant stakeholders and implementation of an appropriate management strategy.	Pre-construction & construction	CEMP S12.3
	H2	All construction personnel will receive training in the management of non-Indigenous relics, including legal obligations, the application of protocols, and the recognition of relics.	Construction	CEMP S12.3.3
Socio-economic issues				
Minimise potential impacts on the Broken Hill community	S1	Advance notification will be given to nearby residents (including any potentially affected property owners and occupants) on the construction schedule, construction works and access arrangements.	Pre-construction & construction	CEMP S17.3.2
Geology and soils				
Minimise potential for soil erosion	GS1	The commitments identified for <i>Water management</i> above will address the risks of soil erosion. No additional actions are required for geology and soils.	Pre-construction & construction	CEMP S10.2.1
Air quality and climate				
Minimise dust generation	AQ1	During construction and operation, all exposed surfaces will be monitored for dust generation, and appropriate dust suppression measures, such as watering, re- vegetation or application of environmentally acceptable dust suppressant chemicals will be implemented as required.	Construction	CEMP S13.3.3
	AQ2	The access road connecting the Barrier Highway road verge to the project site will be constructed with packed gravel as required to minimise dust and soil impacts.	Construction	CEMP S13.4.1
	AQ3	Disturbed surfaces will be stabilised and restored as soon as possible using appropriate stabilisation and re-vegetation measures.	Construction	CEMP S13.4.2
	AQ4	Construction vehicles/machinery will not be left running or idling when not in use.	Construction	CEMP S13.4.3
	AQ5	Construction plant will be fitted with appropriate emission controls and will be maintained to reduce exhaust emissions.	Construction	CEMP S13.4.3
	AQ6	Vehicular loads of spoil and other erodible material will be suitably covered during transport.	Construction	CEMP S13.4.3
	AQ7	No burning of vegetation or waste material will take place on the construction site.	Construction	CEMP S13.4.4
Waste management				
Minimise waste generation and disposal	W1	All works will be conducted in accordance with the waste management hierarchy established by the <i>Waste Avoidance and Resource Recovery Act 2001</i> .	Construction	CEMP 15.1
	W2	Excavated spoil will be re-used on the project site for fill or landscaping, where possible.	Construction	CEMP S15.4.2
	W3	Native vegetation cleared for the project will be used in site restoration and landscaping or 'wind-rowed' along the edges of the transmission line easement, where possible.	Construction	CEMP Sub-plan A S4.1.5
Ensure appropriate disposal of wastes	W4	Excess spoil or green waste which cannot be reused on site will be transported to the Broken Hill City Council Recycling facility.	Construction	CEMP S15.2
	W5	Excess materials that are not re-usable or recyclable will be disposed of at the Broken Hill City Council Waste Depot.	Construction	CEMP S15.2
	W6	Transport of wastes to recycling or waste disposal facilities will be undertaken by an appropriately licensed waste transporter.	Construction	CEMP S15.3.2
	W7	Waste oils, greases and chemicals generated during construction will be stored in appropriately banded areas prior to their removal for recycling or disposal.	Construction	CEMP 14.3.3
	W8	Soils contaminated through fuel or chemical spills will be excavated and transported to a licensed waste facility and the resulting excavations will be backfilled with clean soil.	Construction	CEMP 14.3.1
	W9	Invasive weeds will be collected in plastic bags to the extent possible and disposed of at a licensed green waste disposal facility or landfill.	Construction	CEMP S15.4.1
	W10	General wastes will be segregated into recyclable and non-recyclable streams through the provision of appropriate bins on the construction site.	Construction	CEMP S15.4.1

Appendix B – First Solar Health, Safety and Environmental Policy





SMP: 01 First Solar Health (Australia), Safety & Environmental Policy

First Solar is committed to creating a culture where HEALTH, SAFETY AND THE ENVIRONMENT is an integral part of all our employees and subcontractors daily lives, creating a better future for the world by being the HSE industry leader.

We will always conduct our business in a manner that protects the HEALTH AND SAFETY of every person on our sites and protects the ENVIRONMENT around us. We expect all personnel to undertake their work in a manner that does not place either themselves or their colleagues at risk.

We maintain a goal of zero workplace injuries, which is consistent with our vision and values that all workplace injuries are preventable.

To achieve this outcome we will:

- Conduct business in a manner that actively integrates the elements of the First Solar HEALTH, SAFETY AND ENVIRONMENTAL Management Systems into all aspects of our operations;
- Promote First Solar sustainability through ENVIRONMENTAL operational excellence, waste minimization, resource conservation and a world-class recycling program;
- Comply with all applicable laws, regulations and statutory obligations;
- Proactively identify and control HEALTH, SAFETY AND ENVIRONMENTAL hazards and risks in the workplace;
- Support employees, contractors and subcontractors in their decision to stop work and intervene when unsafe acts or conditions are identified;
- Enable First Solar to continuously improve the HEALTH, SAFETY AND ENVIRONMENTAL management systems and our HSE performance through open communication and consultation with employees, clients, subcontractors and visitors;
- Provide the necessary tools, resources and training to facilitate continuous improvement, ensure the objectives and targets derived from this policy are achieved thereby ensuring HSE excellence throughout First Solar operations;
- Maintain proactive leadership in the management of HEALTH, SAFETY AND THE ENVIRONMENT.

Endorsed By: Jack Curtis, Vice President APAC

Date

Appendix C – Worker Environmental Awareness and Compliance Training (WEAC)





Worker Environmental and Compliance (WEAC) Training Broken Hill Solar PV Power Station



Table of Contents

1	Purpose	4
2	Scope.....	4
	2.1 Overview.....	4
	2.2 Broken Hill Power Station Development	4
	2.3 Relevant Approval Conditions	5
3	Objectives	6
4	WEAC Training Targets.....	6
5	WEAC Training	6
	5.1 Onsite Personnel	6
	5.2 Environmental Awareness Site Inductions	7
	5.2.1 <i>Overview</i>	7
	5.2.2 <i>Content</i>	7
	5.3 Environmental Compliance Training	8
	5.3.1 <i>General Environmental Compliance Training</i>	9
	5.3.2 <i>Activity Specific Environmental Compliance Training</i>	9
	5.4 WEAC Training Review.....	10
6	Responsibilities	10
7	Records	11

Document Control

Doc Rev	Date	Reason	Issued by	Review		Review	
A	19/01/14	Issued for AGL and Project ER Review	First Solar	SF	13/12/13	JS	07/01/14
B	20/06/14	Incorporation of ER Comments	Beca	SA	27/06/14		

1 Purpose

This *Worker Environmental Awareness and Compliance Training Procedure* (WEAC Training) for the Broken Hill Solar PV Power Station has been prepared to meet the requirements of:

The Broken Hill Solar PV Power Station Project Approval (MP10-0202):

- Condition A12
- Condition A13
- Condition C3(f)(iv)
- Condition C16(f).
- Broken Hill Solar Plant Submissions and Preferred Project Report (SKM, February 2013):
 - Commitment IH3.

2 Scope

2.1 Overview

As required by the Project Approval MP10-0202 for the Broken Hill Solar PV Power Station, First Solar (Australia) Pty Ltd (First Solar) has developed the following WEAC Training Procedure for the development as it relates to the activities of First Solar. Specifically this WEAC Training Procedure relates to the Construction Phase of the power station.

A second CEMP is being prepared for the power station's grid connection by a separate contractor. The grid connection for the Broken Hill Solar PV Power Station is not under the mandate of First Solar (Australia) Pty Ltd (First Solar) and is not included within the following document. Please refer to the separate grid connection CEMP for information specific to the grid connection construction works.

2.2 Broken Hill Power Station Development

The Broken Hill Solar PV Power Station will consist of a 53MW solar PV power station located approximately 5km south-west of Broken Hill. The solar plant will occupy approximately 140 hectares of land bounded to north by the Barrier Highway and the Peterborough-Broken Hill rail line to the south.

First Solar (Australia) Pty Ltd have been engaged by AGL to provide engineering, procurement and construction (EPC) services. The Broken Hill Solar PV Power Station will utilise First Solar's advanced

cadmium telluride (CdTe) thin film photovoltaic modules. The solar modules generate electricity with no air emissions, no waste production, no water use and have one of the smallest carbon footprints of any current PV technology. Over 7,000MW of First Solar PV modules have been installed worldwide, including at many of the world's largest solar PV plants, since beginning commercial production in 2002. First Solar has been actively involved in the Australian market since mid-2008.

The construction of the Broken Hill Solar PV Power Station project is expected to commence in early July 2014.

2.3 Relevant Approval Conditions

The approval provisions for the Broken Hill Solar PV Power Station relevant to the WEAC Training Procedure are as follows:

Project Approval Conditions:	Document Reference:
<i>A12. The Proponent shall ensure that employees, contractors and sub- contractors are aware of, and comply with, the conditions of this consent relevant to their respective activities.</i>	Section 3
<i>A13. The Proponent shall be responsible for environmental impacts resulting from the actions of all persons that it invites onto the site, including contractors, sub- contractors and visitors.</i>	Section 4
<i>C3(f). an Aboriginal Heritage Plan to monitor and management Aboriginal heritage shall be developed in consultation with OEH and registered Aboriginal stakeholders, and include the following:</i>	Refer to CEMP Sub-plan F <i>Aboriginal Heritage Management Plan</i>
<i>(iv) Aboriginal cultural heritage induction processes for construction personnel.</i>	Section 5.3.2
<i>C16(f). Provisions for ensuring all employees, contractors and sub-contractors are aware of, and comply with, the conditions of this approval relevant to their respective activities.</i>	Sections 5.2 and 5.3
Submission Report Commitments:	Document Reference:
<i>IH3 All construction personnel will be receiving training in the management of Aboriginal artefacts and objects, including legal obligations, the application of protocols, and the recognition of artefacts.</i>	Refer to CEMP Sub-plan F <i>Aboriginal Heritage Management Plan</i> Section 5.3.2

3 Objectives

The objectives of the First Solar Worker Environmental Awareness and Compliance Training (WEAC Training) program are to:

- Ensure that all site personnel are aware of, and comply with, the conditions of the Project Approval
- Ensure that all site personnel are aware of their responsibilities with respect to environmental compliance
- Meet the Project Approval requirements set out in Section 2.3 (above), being specifically Condition A12 and C16(f).

4 WEAC Training Targets

It is the aim of the First Solar WEAC Training program to ensure that all employees, contractors and sub-contractors receive (where applicable):

- Site specific Environmental Awareness Induction
- Site specific Environmental Compliance Training.

The purpose of the WEAC Training is to help First Solar meet the CEMP Objectives and Targets outlined in Section 5 of the CEMP overarching document, with respect to environmental compliance.

Further, the First Solar WEAC Training program has been designed to help First Solar ensure that all onsite personnel comply with all of the environmental conditions and commitments for which it is responsible (in accordance with Condition A13).

5 WEAC Training

5.1 Onsite Personnel

As identified within the First Solar Project Site Safety Plan, onsite personnel include:

- Employees
- Contractors (including sub-contractors)
- Visitors

- Non-Inducted Delivery Drivers.

Visitors are defined under the *Project Site Safety Plan* as:

“A person who attends the Project Site solely to conduct a site inspection, attend a meeting etc”.

No visitor shall be permitted to conduct any form of physical labour whilst on site. Activities are restricted to office based work and observation whilst in the field.

Regular visitors to the site will be expected to undertake a full site induction. Regular visitors may include office based First Solar employees.

5.2 Environmental Awareness Site Inductions

5.2.1 Overview

The follow site inductions will be available:

- Employee and Contractor Environmental Awareness
- Visitor Environmental Awareness
- Non-Inducted Delivery Driver Environmental Awareness.

All inductions will be specific to the Broken Hill site and will vary in content subject to the audience. For example, the Employee and Contractor Environmental Awareness will be more detailed than the induction for Visitors.

Site Environmental Awareness Inductions will be required to be undertaken by personnel prior to beginning work.

5.2.2 Content

Site Environmental Inductions will include, but not be limited to, the following:

- Project environmental compliance obligations
- Potential consequences of non-conformance
- An overview of the CEMP and key requirements
- Specific emphasis on requirements / procedures relating to:
 - Aboriginal heritage
 - Air quality (dust) management
 - Complaints management
 - Fauna interactions

- Ground cover management
- Habitat disturbance
- Historical heritage
- Onsite noise management
- Incident management and spill response
- Soil and water management
- Waste Management.
- Environmental emergency procedures, including site contacts
- Environmental risks associated with the construction activities (as identified in Section 3.5 of the CEMP parent document)
- The potential environmental impacts associated with specific construction activities.

Onsite traffic management will form part of the Health and Safety Induction for the site. Onsite traffic management is captured within the First Solar Vehicle Movement Plan which forms part of the Broken Hill Project Site Safety Plan.

All personnel completing the Worker Environmental Awareness Inductions will be asked to fill in Form-PO6 (see Environmental Management Schedules, CEMP Appendix D).

5.3 Environmental Compliance Training

Two types of training are captured under the Training component of the First Solar WEAC Training system:

1. General WEAC Training
2. Activity Specific WEAC Training

Environmental Compliance Training may be provided to onsite personnel in various ways, including:

- Daily pre-start meetings
- Toolbox meetings
- Activity specific training sessions with relevant personnel
- Notices or posters.

Training will include both scheduled and non-scheduled training (e.g. in response to an incident). Onsite activities will be monitored by the Site Environmental Advisor and training opportunities will be identified in consultation with the Site Construction Manager and relevant onsite personnel.

All personnel completing the Worker Environmental Compliance Training will be asked to fill in Form-P07 (see Environmental Management Schedules, CEMP Appendix D).

5.3.1 General Environmental Compliance Training

General Compliance Training will be undertaken to a larger audience, e.g. at a pre-start or toolbox meeting. This training will include environmental compliance obligations that are relate to all onsite personnel.

General Compliance Training will be used to communicate changes to the Environmental Awareness Induction to ensure that this information is made available to existing onsite personnel.

5.3.2 Activity Specific Environmental Compliance Training

In accordance with Condition C16(f), Activity Specific Compliance Training will be targeted. This type of training will be utilised ensure that onsite personnel are made aware of, and comply with, the conditions of the Project Approval that are relevant to their respective activities.

For example, personnel associated with vegetation removal will be made aware of the requirements within **CEMP Sub-plan A Flora and Fauna Management Plan** with respect to the *Raptor Management Plan*.

The site induction for all construction staff will include Aboriginal cultural heritage issues. This component will be presented by an individual who has a good working knowledge of the Aboriginal sites and of the legislation protecting them. The content will include legislative protection of Aboriginal sites, application of protocols and the recognition of artefacts.

Other Activity Specific Environmental Compliance Training may include:

- Erosion and sediment control
- Dangerous goods and spill response
- Waste management.

Specific training needs will be identified by the Site Environmental Advisor in consultation with the Site Construction Manager and Site Supervisors.

5.4 WEAC Training Review

The First Solar Site Environmental Advisor will be responsible for ensuring that the WEAC Training is up-to-date and relevant to onsite activities.

Circumstances that may require the WEAC Training will be reviewed and updated include the following:

- Where there is a change to environmental controls and procedures outlined within the CEMP (e.g. in response to changes to the CEMP post a CEMP review under CEMP-T CEMP Audit and Review)
- Where there is a change to the construction layout or methodology
- In response to changes to the construction schedule
- In response to a change to the First Solar Project Site Safety Plan (where this impacts onsite environmental management controls and procedures).

The purpose of a review of the WEAC Training is to ensure that First Solar can continue to meet the Objectives for the WEAC Training (refer to Section 3).

6 Responsibilities

All Site Personnel

- Completion of Worker Environmental Awareness and Compliance Training
- Attendance at daily pre-start meeting and toolbox meetings
- Compliance with Development Consent Conditions relevant to their respective activities
- Request Activity Specific Environmental Compliance Training via the Site Supervisors, Site Construction Manager or directly with the Site Environmental Advisor.

Site Environmental Advisor

- Lead / facilitate environmental inductions for all site personnel
- Lead / facilitate environmental training for all site personnel
- Update environmental inductions / training (as required)
- Work with the Site Construction Manager and Site Supervisors to identify Activity Specific Environmental Compliance Training opportunities

- Raise environmental awareness onsite
- Manage documentation for WEAC Training (Form-S01 and Form-S02).

7 Records

The WEAC training records are included as part of Appendix D – CEMP Environmental Management Schedules. The records comprise:

- Completion of Worker Environmental Awareness Induction recorded on Form-P06.
- Completion of Work Environmental Compliance Training recorded on Form-P07.

Appendix D – Register of Construction Hazards and Environmental Risk Assessment



Stage	No	Risk No	Activity	Aspect	Impact	Likelihood	Column Ref	Consequence	Row Ref	Risk Level	Environmental Control Measures	Likelihood	C_Column Ref	Consequence	C_Row Ref	Risk Level	Responsible Person First Solar	CEMP Sub-plan/s
Mobilisation, site preparation and construction of ancillary facilities	M1	M1.1	Install temporary perimeter fencing around the site for the duration of construction	Flora and fauna	Injury to fauna, damage to equipment	Unlikely	2	Minor	2	Medium	Ecological pre-clearance surveys and weed management plan.	Unlikely	2	Minor	2	Medium	Site Environmental Advisor	A - Flora and Fauna. - Landscape.
	M2	M2.1	Install construction water pond, and water supply pipeline	Flora and fauna	Vegetation clearance, fauna and habitat impacts along pipeline route and within pond footprint	Likely	3	Minor	2	Medium	Ecological pre-clearance surveys and weed management plan.	Very unlikely	1	Minor	2	Low	Site Environmental Advisor	A - Flora and Fauna.
		M2.3		Cultural heritage	Damage to artefacts along pipeline route	Unlikely	2	Major	4	High	Mapping of sensitive areas. Notification of unexpected finds (cultural heritage).	Very unlikely	1	Moderate	3	Medium	Site Environmental Advisor	F - Aboriginal Heritage. Historical Heritage.
		M2.4		Noise	Noise nuisance to receptors along pipeline route, including recreational users	Unlikely	2	Minor	2	Medium	Undertake activity during daytime hours. Distance to nearest residence provides attenuation. Notify nearest residences about the type and duration of noise.	Very unlikely	1	Insignificant	1	Low	Site Project Manager	D - Construction Noise and Vibration.
		M2.5		Dust	Dust generation, air quality and deposition	Likely	3	Minor	2	Medium	Apply water sprays, discontinue work under high wind conditions, cover any stockpiled materials.	Unlikely	2	Insignificant	1	Low	Site Environmental Advisor	J - Dust and Air Quality.
		M2.6		Sediment and erosion, stockpiles and stormwater	Siltation of waterways near watercourse crossings	Likely	3	Minor	2	Medium	Soil and water management. Ground cover management.	Unlikely	2	Insignificant	1	Low	Site Environmental Advisor	G - Soil and Water. B - Ground Cover
	M3	M3.1	Locate temporary construction offices, laydown areas and vehicle/equipment maintenance areas	Stormwater management	Siltation of downstream waterbodies	Likely	3	Insignificant	1	Medium	Soil and water management.	Unlikely	2	Insignificant	1	Low	Site Environmental Advisor	G - Soil and Water.
		M3.2		Hazardous materials and dangerous goods	Release to waterbodies and land resulting in ecotoxic effects	Likely	3	Moderate	3	High	Designation of fuel storage and maintenance areas. Storage of hazardous materials/dangerous goods in accordance with Australian Standards.	Unlikely	2	Minor	2	Medium	Site Construction Manager	K - Dangerous Goods and Spill Response
	M4	M4.1	Earthworks for construction of power station access road and construction parking areas	Vehicles and roads	Traffic impacts	Likely	3	Minor	2	Medium	Traffic signage on access roads. Traffic management plan.	Unlikely	2	Minor	2	Medium	Site Construction Manager	E - Construction Traffic.
		M4.2		Flora and fauna	Vegetation clearance, fauna and habitat impacts along pipeline route and within construction area	Likely	3	Minor	2	Medium	Ecological pre-clearance surveys.	Unlikely	2	Minor	2	Medium	Site Environmental Advisor	A - Flora and Fauna. H - Revegetation and Rehabilitation.
		M4.3		Cultural heritage	Unexpected find and potential damage to artefact	Unlikely	2	Minor	2	Medium	Mapping of sensitive areas. Notification of unexpected finds (cultural heritage).	Unlikely	2	Minor	2	Medium	Site Environmental Advisor	F - Aboriginal Heritage. Historical Heritage.
		M4.4		Sediment and erosion, stockpiles and stormwater	Siltation of downstream waterbodies	Likely	3	Minor	2	Medium	Soil and water management. Ground cover management.	Unlikely	2	Minor	2	Medium	Site Environmental Advisor	G - Soil and Water. B - Ground Cover
		M4.5		Noise	Noise generation	Likely	3	Minor	2	Medium	Undertake activity during daytime hours. Distance to nearest residence provides attenuation. Notify nearest residences about the type and duration of noise.	Unlikely	2	Insignificant	1	Low	Site Project Manager	D - Construction Noise and Vibration.
		M4.6		Dust	Dust generation, air quality and deposition	Likely	3	Minor	2	Medium	Apply water sprays, discontinue work under high wind conditions, cover any stockpiled materials. Implement corrective actions in response to community complaints.	Unlikely	2	Insignificant	1	Low	Site Environmental Advisor	J - Dust and Air Quality.
	M6	M5.1	Clear vegetation and undertake minor grading of areas for permanent site office and switchyard (estimated vegetation clearance of 140 ha in total)	Flora and fauna	Vegetation clearance, fauna and habitat impacts within construction area	Likely	3	Minor	2	Medium	Ecological pre-clearance surveys and weed management plan.	Unlikely	2	Minor	2	Medium	Site Environmental Advisor	A - Flora and Fauna. H - Revegetation and Rehabilitation.
		M5.2		Cultural heritage	Unexpected find and potential damage to artefact	Unlikely	2	Moderate	3	Medium	Mapping of sensitive areas. Notification of unexpected finds (cultural heritage).	Very unlikely	1	Minor	2	Low	Site Environmental Advisor	F - Aboriginal Heritage. Historical Heritage.
		M5.3		Sediment and erosion, stockpiles and stormwater	Siltation of downstream waterbodies	Likely	3	Minor	2	Medium	Soil and water management. Ground cover management.	Unlikely	2	Minor	2	Medium	Site Environmental Advisor	G - Soil and Water. B - Ground Cover
		M5.4		Noise	Noise generation	Likely	3	Minor	2	Medium	Undertake activity during daytime hours. Distance to nearest residence provides attenuation. Notify nearest residences about the type and duration of noise.	Unlikely	2	Insignificant	1	Low	Project Manager	D - Construction Noise and Vibration.
		M5.5		Dust	Dust generation, air quality and deposition	Likely	3	Minor	2	Medium	Apply water sprays, discontinue work under high wind conditions, cover any stockpiled materials. Implement corrective actions in response to community complaints.	Unlikely	2	Minor	2	Medium	Site Environmental Advisor	J - Dust and Air Quality.
		M5.6		Waste storage and disposal	Accumulation of rubbish at project site - introduction of pests or other undesirable wildlife	Likely	3	Minor	2	Medium	Dispose clean inert materials to appropriate category in transfer station. Reuse any materials or plant that is in good operating condition.	Very unlikely	1	Insignificant	1	Low	Site Environmental Advisor	L - Waste
	M7	M6.1	Install drainage channels to manage water flows across the site	Flora and fauna	Vegetation clearance, fauna and habitat impacts within construction area	Likely	3	Moderate	3	High	Ecological pre-clearance surveys.	Unlikely	2	Minor	2	Medium	Site Environmental Advisor	A - Flora and Fauna.
		M6.2		Cultural heritage	Unexpected find and potential damage to artefact	Unlikely	2	Moderate	3	Medium	Mapping of sensitive areas. Notification of unexpected finds (cultural heritage).	Unlikely	2	Minor	2	Medium	Site Environmental Advisor	F - Aboriginal Heritage. Historical Heritage.
		M6.3		Sediment and erosion, stockpiles and stormwater	Siltation of downstream waterbodies	Likely	3	Moderate	3	High	Soil and water management.	Unlikely	2	Minor	2	Medium	Site Environmental Advisor	G - Soil and Water. B - Ground Cover
		M6.4		Noise	Noise generation	Likely	3	Minor	2	Medium	Undertake activity during daytime hours. Distance to nearest residence provides attenuation. Notify nearest residences about the type and duration of noise.	Unlikely	2	Insignificant	1	Low	Site Project Manager	D - Construction Noise and Vibration.
		M6.5		Dust	Dust generation, air quality and deposition	Likely	3	Minor	2	Medium	Apply water sprays, discontinue work under high wind conditions, cover any stockpiled materials. Implement corrective actions in response to community complaints.	Unlikely	2	Minor	2	Medium	Site Environmental Advisor	J - Dust and Air Quality.
Construction of power station	C1	C1.1	Transport of materials to site	Vehicles and roads	Traffic impacts	Likely	3	Moderate	3	High	Traffic signage on access roads. Traffic management plan.	Unlikely	2	Minor	2	Medium	Site Construction Manager	E - Construction Traffic.
		C1.2		Flora and fauna	Fauna injury or fatality	Unlikely	2	Minor	2	Medium	Traffic signage on access roads. Traffic management plan.	Unlikely	2	Minor	2	Medium	Site Environmental Advisor	A - Flora and Fauna.
		C1.3		Noise	Noise generation	Unlikely	2	Minor	2	Medium	Traffic signage on access roads. Traffic management plan.	Unlikely	2	Minor	2	Medium	Site Project Manager	D - Construction Noise and Vibration.
		C1.4		Dust	Dust generation	Likely	3	Minor	2	Medium	Traffic signage and road watering.	Unlikely	2	Insignificant	1	Low	Site Environmental Advisor	J - Dust and Air Quality.
		C1.5		Air	Vehicle emissions	Unlikely	2	Insignificant	1	Low	Vehicle checks and maintenance.	Unlikely	2	Insignificant	1	Low	Site Environmental Advisor	J - Dust and Air Quality.
		C1.6		Storage and handling of hazardous materials	Release to waterbodies and land resulting in ecotoxic effects	Likely	3	Minor	2	Medium	Designation of fuel storage and maintenance areas. Storage of hazardous materials/dangerous goods in accordance with Australian Standards.	Unlikely	2	Minor	2	Medium	Site Construction Manager	K - Dangerous Goods and Spill Response
	C2	C2.1	Install steel vertical support posts for array tables (piles driven to ~1.5 m depth)	Vehicles and roads	Traffic impacts	Likely	3	Moderate	3	High	Traffic signage on access roads. Traffic management plan.	Unlikely	2	Minor	2	Medium	Site Construction Manager	E - Construction Traffic.
		C2.2		Flora and fauna	Vegetation clearance, fauna and habitat impacts	Unlikely	2	Minor	2	Medium	Ecological pre-clearance surveys.	Very unlikely	1	Minor	2	Low	Site Environmental Advisor	A - Flora and Fauna.

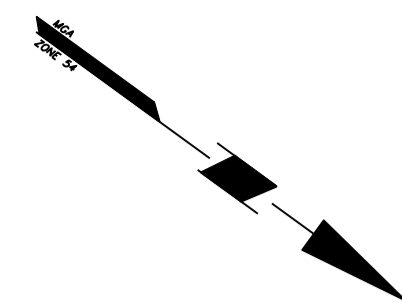
Stage	No	Risk No	Activity	Aspect	Impact	Likelihood	Column Ref	Consequence	Row Ref	Risk Level	Environmental Control Measures	Likelihood	C_Column Ref	Consequence	C_Row Ref	Risk Level	Responsible Person First Solar	CEMP Sub-plan/s
		C2.3		Cultural heritage	Unexpected find and potential damage to artefact	Unlikely	2	Moderate	3	Medium	Mapping of sensitive areas. Notification of unexpected finds (cultural heritage).	Very unlikely	1	Minor	2	Low	Site Environmental Advisor	F - Aboriginal Heritage. Historical Heritage.
		C2.4		Noise	Noise generation	Likely	3	Minor	2	Medium	Undertake activity during daytime hours. Distance to nearest residence provides attenuation. Notify nearest residences about the type and duration of noise.	Likely	3	Minor	2	Medium	Site Project Manager	D - Construction Noise and Vibration.
		C2.5		Vibration	Vibration nuisance to nearest sensitive receptors	Likely	3	Moderate	3	High	Undertake activity during daytime hours. Distance to nearest residence provides attenuation. Notify nearest residences about the type and duration of noise.	Likely	3	Minor	2	Medium	Site Project Manager	D - Construction Noise and Vibration.
		C2.6		Dust	Dust generation, air quality and deposition	Unlikely	2	Minor	2	Medium	Apply water sprays, discontinue work under high wind conditions, cover any stockpiled materials. Implement corrective actions in response to community complaints.	Unlikely	2	Insignificant	1	Low	Site Environmental Advisor	J - Dust and Air Quality.
	C2	C2.1	Install tilt brackets and modular racking tables (beams and rails create framework to support panels)	Vehicles and roads	Traffic impacts	Likely	3	Moderate	3	High	Traffic signage on access roads. Traffic management plan.	Unlikely	2	Minor	2	Medium	Site Construction Manager	E - Construction Traffic.
	C3	C3.1	Undertake trenching and wiring of underground cables	Vehicles and roads	Traffic impacts	Likely	3	Moderate	3	High	Traffic signage on access roads. Traffic management plan.	Unlikely	2	Minor	2	Medium	Site Construction Manager	E - Construction Traffic.
		C3.2		Sediment and erosion, stockpiles and stormwater	Siltation of downstream waterbodies	Likely	3	Moderate	3	High	Soil and water management.	Unlikely	2	Minor	2	Medium	Site Environmental Advisor	G - Soil and Water. B - Ground Cover
		C3.3		Noise	Noise generation	Likely	3	Minor	2	Medium	Undertake activity during daytime hours. Distance to nearest residence provides attenuation. Notify nearest residences about the type and duration of noise.	Unlikely	2	Insignificant	1	Low	Site Project Manager	D - Construction Noise and Vibration.
		C3.4		Dust	Dust generation, air quality and deposition	Likely	3	Minor	2	Medium	Apply water sprays, discontinue work under high wind conditions, cover any stockpiled materials. Implement corrective actions in response to community complaints.	Unlikely	2	Insignificant	1	Low	Site Environmental Advisor	J - Dust and Air Quality.
	C4	C4.1	Connect PV modules to the racking tables	Vehicles and roads	Traffic impacts	Likely	3	Moderate	3	High	Traffic signage on access roads. Traffic management plan.	Unlikely	2	Minor	2	Medium	Site Construction Manager	E - Construction Traffic.
	C5	C5.1	Install inverter and transformer skid	Vehicles and roads	Traffic impacts	Likely	3	Moderate	3	High	Traffic signage on access roads. Traffic management plan.	Unlikely	2	Minor	2	Medium	Site Construction Manager	E - Construction Traffic.
		C5.2		Noise	Noise generation	Likely	3	Minor	2	Medium	Undertake activity during daytime hours. Distance to nearest residence provides attenuation. Notify nearest residences about the type and duration of noise.	Unlikely	2	Minor	2	Medium	Site Project Manager	D - Construction Noise and Vibration.
	C6	C6.1	Commence site rehabilitation works in power station development area	Flora and fauna	Displacement, damage or injury to flora and fauna established throughout construction period	Unlikely	2	Minor	2	Medium	Ecological pre-clearance surveys.	Very unlikely	1	Minor	2	Low	Site Environmental Advisor	A - Flora and Fauna.
		C6.2		Dust	Dust generation, air quality and deposition	Unlikely	2	Minor	2	Medium	Apply water sprays, discontinue work under high wind conditions, cover any stockpiled materials. Check revegetation areas for dust cover.	Unlikely	2	Insignificant	1	Low	Site Environmental Advisor	J - Dust and Air Quality.
		C6.3		Sediment and erosion, stockpiles and stormwater	Siltation of downstream waterbodies, including site drainage channels	Likely	3	Minor	2	Medium	Soil and water management. Ground cover management.	Unlikely	2	Minor	2	Medium	Site Environmental Advisor	G - Soil and Water. B - Ground Cover
Commissioning	S1	S1.1	Commission and test solar plant - each array block would be commissioned as it is completed	None	na													
Demobilisation	D1	D1.1	Remove temporary construction facilities and rehabilitate temporary access tracks	Vehicles and roads	Traffic impacts	Likely	3	Minor	2	Medium	Traffic signage on access roads. Traffic management plan.	Unlikely	2	Insignificant	1	Low	Site Construction Manager	E - Construction Traffic.
		D1.2		Noise	Noise generation	Likely	3	Minor	2	Medium	Undertake activity during daytime hours. Distance to nearest residence provides attenuation. Notify nearest residences about the type and duration of noise.	Unlikely	2	Insignificant	1	Low	Site Project Manager	D - Construction Noise and Vibration.
		D1.3		Dust	Dust generation and deposition on revegetation plantings	Likely	3	Minor	2	Medium	Apply water sprays, discontinue work under high wind conditions, cover any stockpiled materials. Implement corrective actions in response to community complaints.	Unlikely	2	Minor	2	Medium	Site Environmental Advisor	J - Dust and Air Quality.
		D1.4		Sediment and erosion, stockpiles and stormwater	Siltation of downstream waterbodies, including site drainage channels	Unlikely	2	Minor	2	Medium	Soil and water management. Ground cover management.	Unlikely	2	Insignificant	1	Low	Site Environmental Advisor	G - Soil and Water. B - Ground Cover
		D1.5		Waste storage and disposal	Accumulation of rubbish at project site - introduction of pests or other wildlife	Likely	3	Minor	2	Medium	Dispose clean inert materials to appropriate category in transfer station. Reuse any materials or plant that is in good operating condition.	Unlikely	2	Minor	2	Medium	Site Environmental Advisor	L - Waste
	D2	D2.1	Complete works within the power station development area	None	na													

Appendix E – Civil Drawings

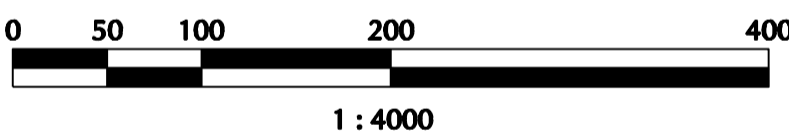
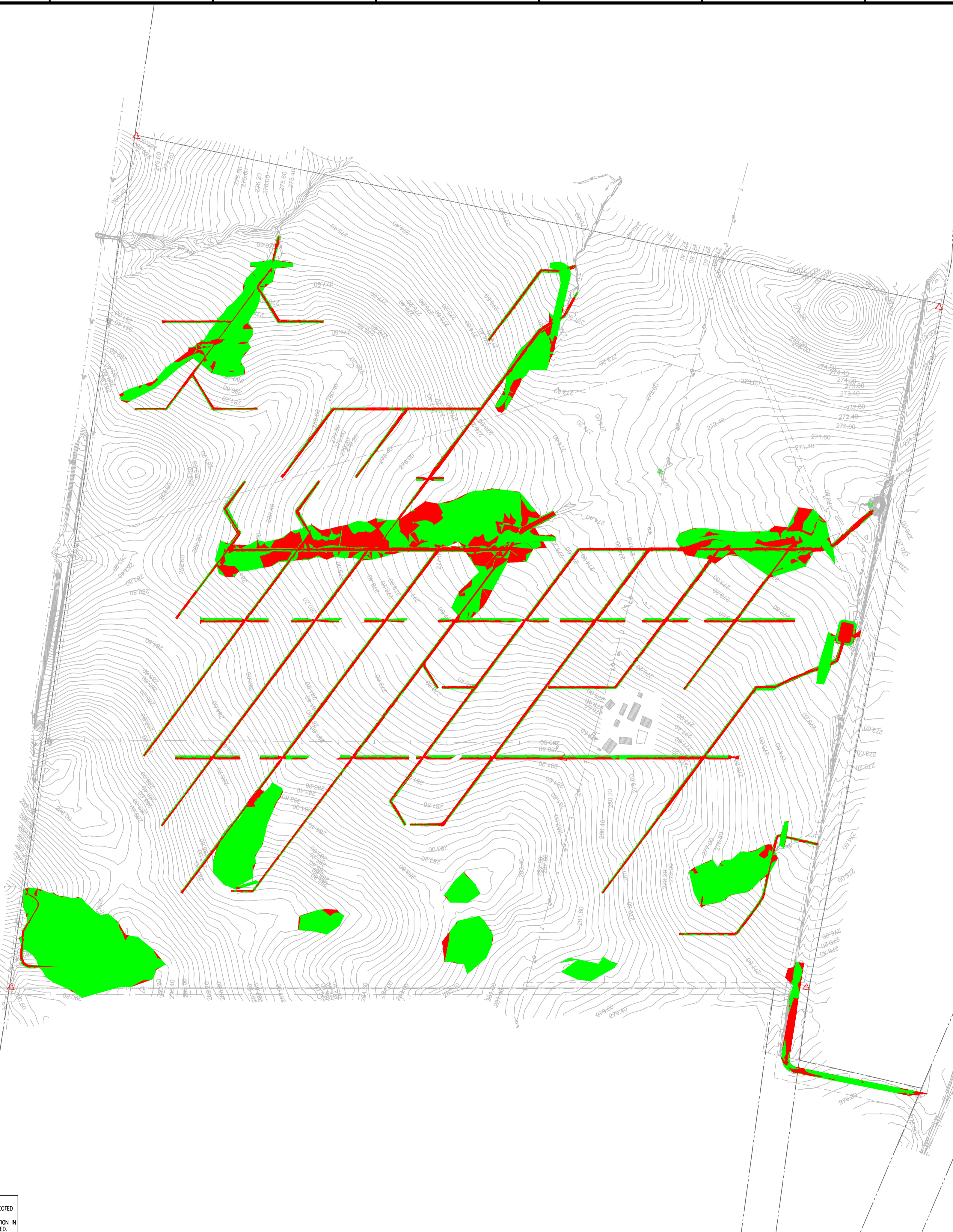


A B C D E F G H I J K

1
2
3
4
5
6
7
8



CUT/FILL LEGEND		
	VOLUME(Cu.M)	COLOR
CUT	19,430	■
FILL	22,220	■



LANGAN

REV	DATE	DESCRIPTION	BY	CHK	APP
0	10-02-2014	ISSUED FOR CONSTRUCTION	KMH	CE	RB

THIS PRINT IS DESIGNED FOR ISO-A1, (841mm X 594mm) PLOTTING
 THIS PRINT IS NOT TO BE USED FOR CONSTRUCTION UNLESS NOTED AND SIGNED OK FOR CONSTRUCTION ABOVE LAST REVISION.

	FIRST SOLAR ELECTRIC LLC. 400 CROSSING BLVD. 5TH FLOOR BRIDGEWATER, NJ 08807 PHONE: (908) 809-4000 FAX: (908) 809-4020 WWW.FIRSTSOLAR.COM
	DEVELOPER: AGL PV SOLAR DEVELOPMENTS PTY LIMITED

TITLE: **BROKEN HILL SOLAR PARK
 BROKEN HILL, NEW SOUTH WALES
 AUSTRALIA**

PROJECT: **53.76 MWac SOLAR PHOTOVOLTAIC SYSTEM**

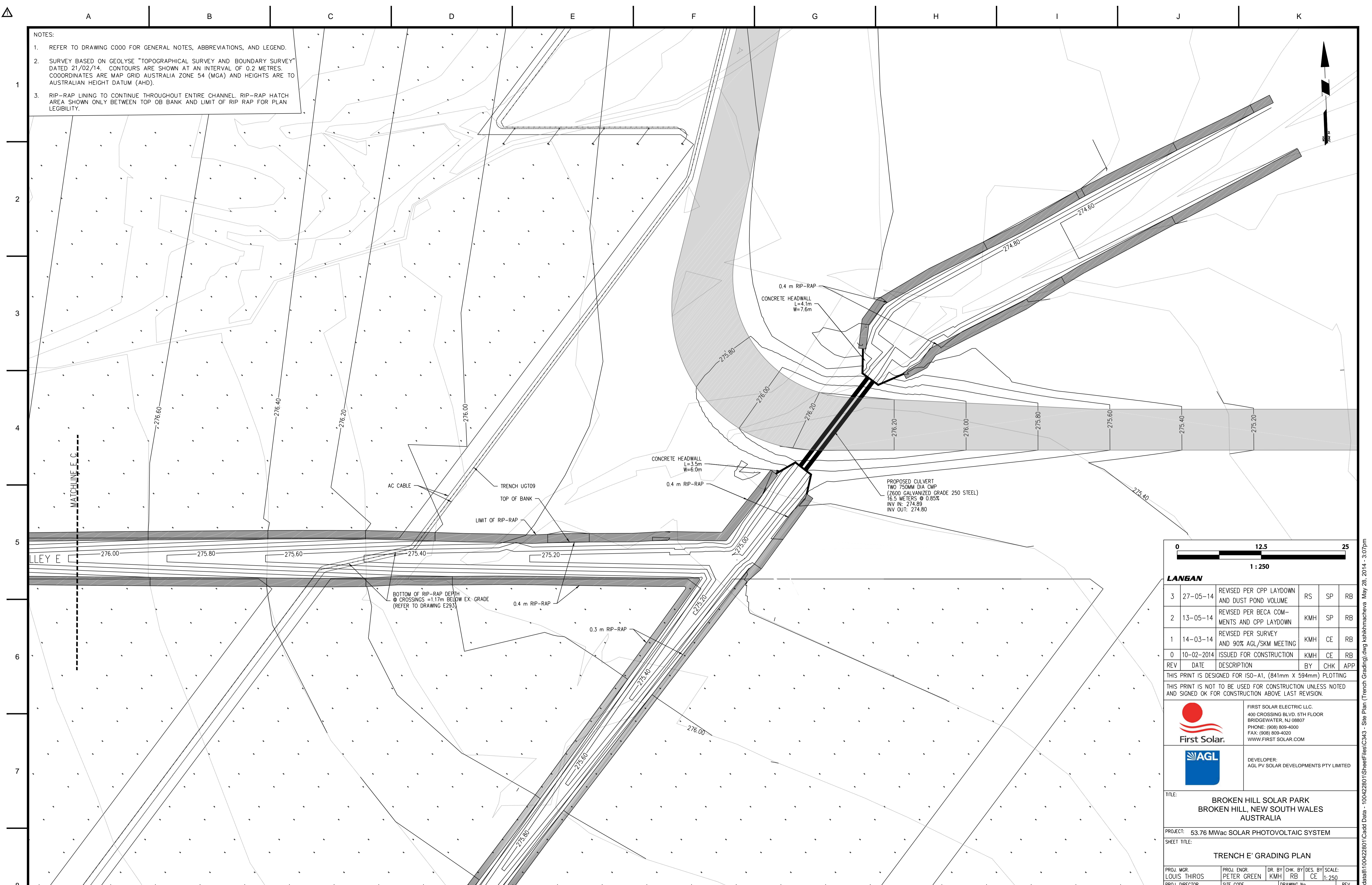
SHEET TITLE: **CUT/FILL MODEL**

PROJ. MGR. LOUIS THIROIS	PROJ. ENGR. PETER GREEN	DR. BY KMH	CHK. BY RB	DES. BY CE	SCALE: 1:4000
PROJ. DIRECTOR JIM GIOVAS	SITE CODE	DRAWING No.	REV.		
FIRST SOLAR JOB No. SYS-00061	ABH1	FG15	-		
DOCUMENT No.	BH-FS-CI-DWG-FG15				

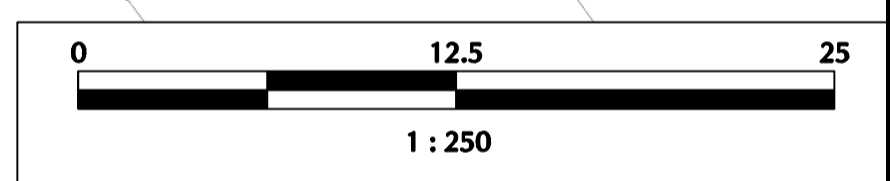
DIAL BEFORE YOU DIG
 www.1100.com.au

THIS PUBLICATION CONTAINS VALUABLE PROPRIETARY AND CONFIDENTIAL INFORMATION OF FIRST SOLAR, INC. ("FIRST SOLAR") WHICH RETAINS ALL COPYRIGHT RIGHTS TO IT UNDER 17 U.S.C. SECTION 106 AND IS PROTECTED BY U.S. AND INTERNATIONAL LAW. ANY REPRODUCTION, PREPARATION OF DERIVATIVE WORKS, DISTRIBUTION, PUBLIC PERFORMANCE OR DISPLAY, DISCLOSURE, AND/OR USE OF ALL OR ANY PORTION OF THIS PUBLICATION IN ANY FORM OR MEDIUM WITHOUT SPECIFIC WRITTEN AUTHORIZATION FROM FIRST SOLAR IS STRICTLY PROHIBITED.

\\langan.com\data\EP\data\100422801\Cadd Data - 100422801\SheetFiles\FG15 CUT FILL MODEL.dwg \$parent May 28, 2014 - 5:50pm



- NOTES:
- REFER TO DRAWING C000 FOR GENERAL NOTES, ABBREVIATIONS, AND LEGEND.
 - SURVEY BASED ON GEOLYSE "TOPOGRAPHICAL SURVEY AND BOUNDARY SURVEY" DATED 21/02/14. CONTOURS ARE SHOWN AT AN INTERVAL OF 0.2 METRES. COORDINATES ARE MAP GRID AUSTRALIA ZONE 54 (MGA) AND HEIGHTS ARE TO AUSTRALIAN HEIGHT DATUM (AHD).
 - RIP-RAP LINING TO CONTINUE THROUGHOUT ENTIRE CHANNEL. RIP-RAP HATCH AREA SHOWN ONLY BETWEEN TOP OB BANK AND LIMIT OF RIP RAP FOR PLAN LEGIBILITY.




LANGAN

REV	DATE	DESCRIPTION	BY	CHK	APP
3	27-05-14	REVISED PER CPP LAYDOWN AND DUST POND VOLUME	RS	SP	RB
2	13-05-14	REVISED PER BECA COMMENTS AND CPP LAYDOWN	KMH	SP	RB
1	14-03-14	REVISED PER SURVEY AND 90% AGL/SKM MEETING	KMH	CE	RB
0	10-02-2014	ISSUED FOR CONSTRUCTION	KMH	CE	RB

THIS PRINT IS DESIGNED FOR ISO-A1, (841mm X 594mm) PLOTTING
 THIS PRINT IS NOT TO BE USED FOR CONSTRUCTION UNLESS NOTED AND SIGNED OK FOR CONSTRUCTION ABOVE LAST REVISION.



FIRST SOLAR ELECTRIC LLC.
 400 CROSSING BLVD, 5TH FLOOR
 BRIDGEWATER, NJ 08807
 PHONE: (908) 809-4000
 FAX: (908) 809-4020
 WWW.FIRSTSOLAR.COM



DEVELOPER:
 AGL PV SOLAR DEVELOPMENTS PTY LIMITED


TITLE: **BROKEN HILL SOLAR PARK
 BROKEN HILL, NEW SOUTH WALES
 AUSTRALIA**

PROJECT: **53.76 MWac SOLAR PHOTOVOLTAIC SYSTEM**

SHEET TITLE: **TRENCH E' GRADING PLAN**

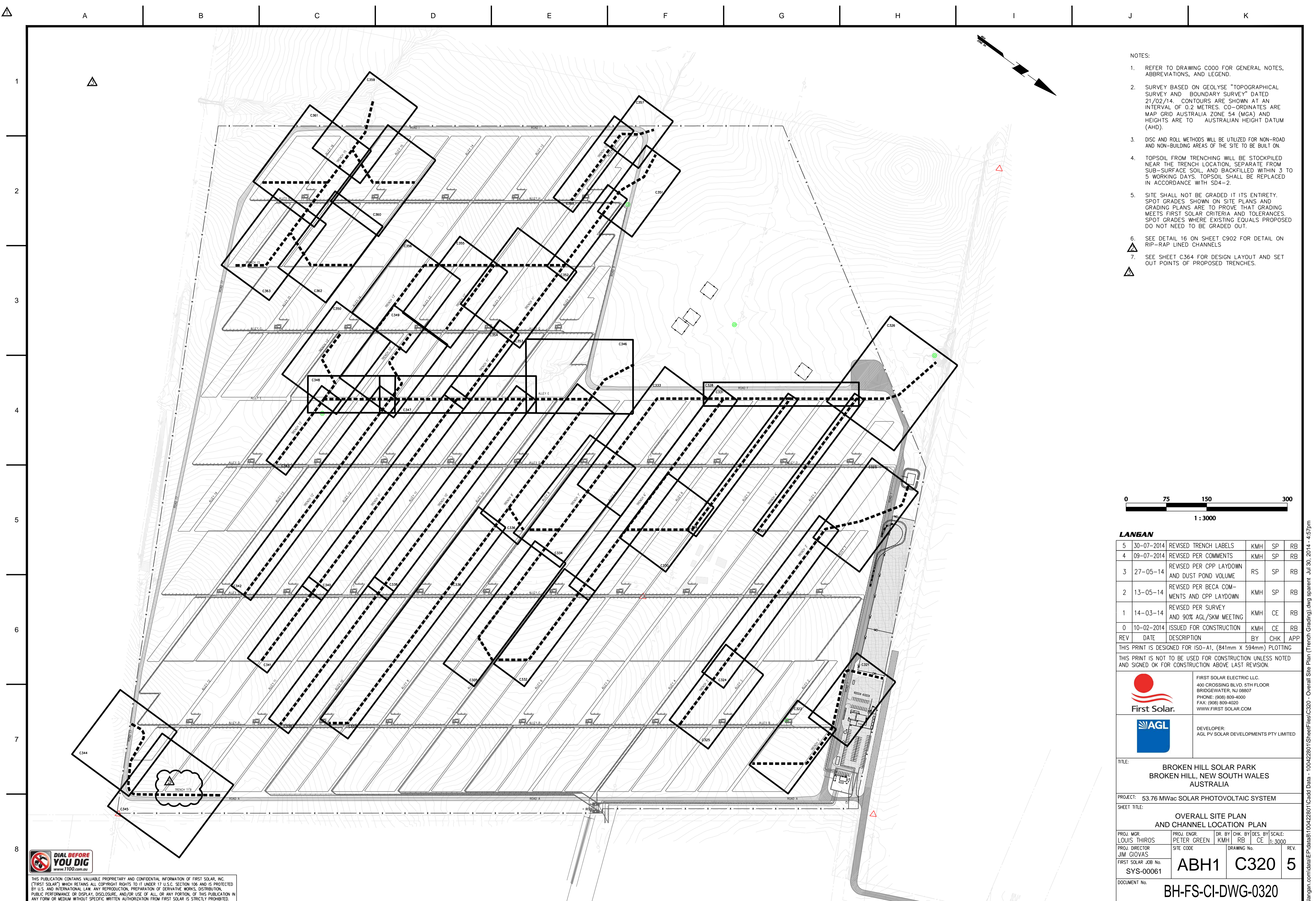
PROJ. MGR. LOUIS THIROIS	PROJ. ENGR. PETER GREEN	DR. BY KMH	CHK. BY RB	DES. BY CE	SCALE: 1:250
PROJ. DIRECTOR JIM GIOVAS	SITE CODE	DRAWING No.	REV.		
FIRST SOLAR JOB No. SYS-00061	ABH1	C346	3		

DOCUMENT No. **BH-FS-CI-DWG0346**

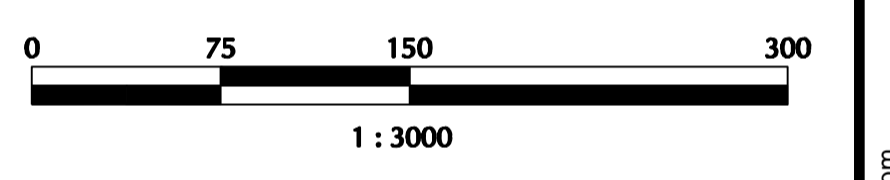


THIS PUBLICATION CONTAINS VALUABLE PROPRIETARY AND CONFIDENTIAL INFORMATION OF FIRST SOLAR, INC. ("FIRST SOLAR") WHICH RETAINS ALL COPYRIGHT RIGHTS TO IT UNDER 17 U.S.C. SECTION 106 AND IS PROTECTED BY U.S. AND INTERNATIONAL LAW. ANY REPRODUCTION, PREPARATION OF DERIVATIVE WORKS, DISTRIBUTION, PUBLIC PERFORMANCE OR DISPLAY, DISCLOSURE, AND/OR USE OF ALL OR ANY PORTION OF THIS PUBLICATION IN ANY FORM OR MEDIUM WITHOUT SPECIFIC WRITTEN AUTHORIZATION FROM FIRST SOLAR IS STRICTLY PROHIBITED.

\\langan.com\data\EP\data\100422801\Cadd Data - 100422801\SheetFiles\C343 - Site Plan (Trench Grading).dwg kshikhmaheva May 28, 2014 - 3:07pm



- NOTES:
- REFER TO DRAWING C000 FOR GENERAL NOTES, ABBREVIATIONS, AND LEGEND.
 - SURVEY BASED ON GEOLYSE "TOPOGRAPHICAL SURVEY AND BOUNDARY SURVEY" DATED 21/02/14. CONTOURS ARE SHOWN AT AN INTERVAL OF 0.2 METRES. CO-ORDINATES ARE MAP GRID AUSTRALIA ZONE 54 (MGA) AND HEIGHTS ARE TO AUSTRALIAN HEIGHT DATUM (AHD).
 - DISC AND ROLL METHODS WILL BE UTILIZED FOR NON-ROAD AND NON-BUILDING AREAS OF THE SITE TO BE BUILT ON.
 - TOPSOIL FROM TRENCHING WILL BE STOCKPILED NEAR THE TRENCH LOCATION, SEPARATE FROM SUB-SURFACE SOIL, AND BACKFILLED WITHIN 3 TO 5 WORKING DAYS. TOPSOIL SHALL BE REPLACED IN ACCORDANCE WITH SD4-2.
 - SITE SHALL NOT BE GRADED IT ITS ENTIRETY. SPOT GRADES SHOWN ON SITE PLANS AND GRADING PLANS ARE TO PROVE THAT GRADING MEETS FIRST SOLAR CRITERIA AND TOLERANCES. SPOT GRADES WHERE EXISTING EQUALS PROPOSED DO NOT NEED TO BE GRADED OUT.
 - SEE DETAIL 16 ON SHEET C902 FOR DETAIL ON RIP-RAP LINED CHANNELS
 - SEE SHEET C364 FOR DESIGN LAYOUT AND SET OUT POINTS OF PROPOSED TRENCHES.



LANGAN

5	30-07-2014	REVISED TRENCH LABELS	KMH	SP	RB
4	09-07-2014	REVISED PER COMMENTS	KMH	SP	RB
3	27-05-14	REVISED PER CPP LAYDOWN AND DUST POND VOLUME	RS	SP	RB
2	13-05-14	REVISED PER BECA COMMENTS AND CPP LAYDOWN	KMH	SP	RB
1	14-03-14	REVISED PER SURVEY AND 90% AGL/SKM MEETING	KMH	CE	RB
0	10-02-2014	ISSUED FOR CONSTRUCTION	KMH	CE	RB
REV	DATE	DESCRIPTION	BY	CHK	APP

THIS PRINT IS DESIGNED FOR ISO-A1, (841mm X 594mm) PLOTTING
 THIS PRINT IS NOT TO BE USED FOR CONSTRUCTION UNLESS NOTED AND SIGNED OK FOR CONSTRUCTION ABOVE LAST REVISION.

	FIRST SOLAR ELECTRIC LLC. 400 CROSSING BLVD, 5TH FLOOR BRIDGEWATER, NJ 08807 PHONE: (908) 809-4000 FAX: (908) 809-4020 WWW.FIRSTSOLAR.COM
	DEVELOPER: AGL PV SOLAR DEVELOPMENTS PTY LIMITED

TITLE: **BROKEN HILL SOLAR PARK
 BROKEN HILL, NEW SOUTH WALES
 AUSTRALIA**

PROJECT: **53.76 MWac SOLAR PHOTOVOLTAIC SYSTEM**

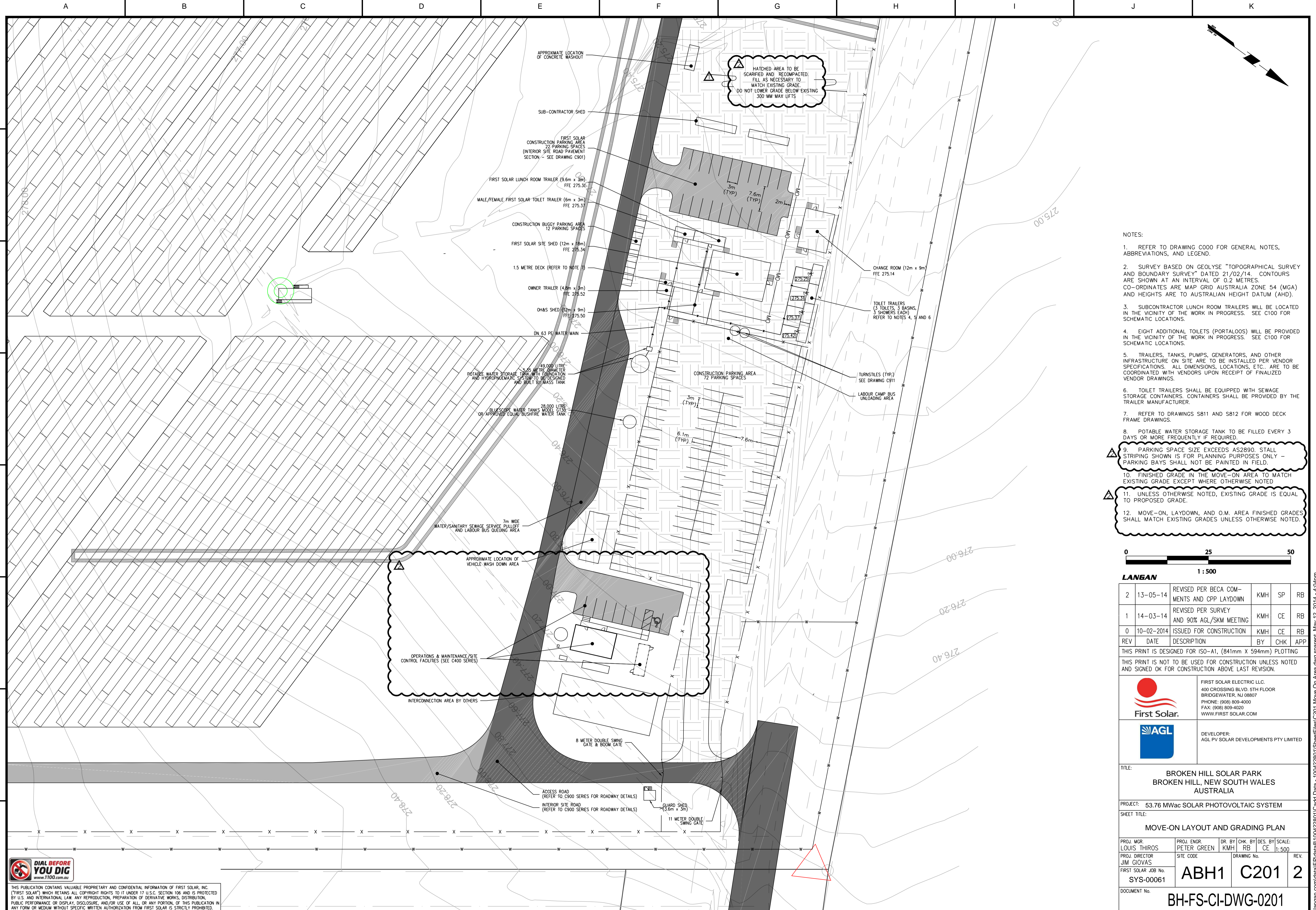
SHEET TITLE: **OVERALL SITE PLAN
 AND CHANNEL LOCATION PLAN**

PROJ. MGR. LOUIS THIROIS	PROJ. ENGR. PETER GREEN	DR. BY KMH	CHK. BY RB	DES. BY SCALE: CE	1:3000
PROJ. DIRECTOR JIM GIOVAS	SITE CODE	DRAWING No.	REV.		
FIRST SOLAR JOB No. SYS-00061	ABH1	C320	5		

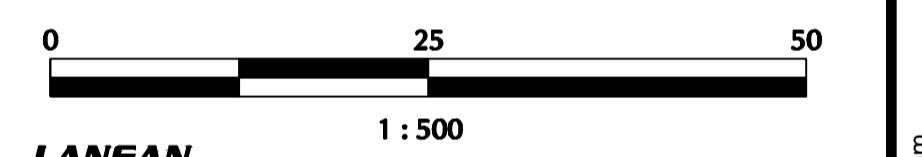
DOCUMENT No. **BH-FS-CI-DWG-0320**

THIS PUBLICATION CONTAINS VALUABLE PROPRIETARY AND CONFIDENTIAL INFORMATION OF FIRST SOLAR, INC. ("FIRST SOLAR") WHICH RETAINS ALL COPYRIGHT RIGHTS TO IT UNDER 17 U.S.C. SECTION 106 AND IS PROTECTED BY U.S. AND INTERNATIONAL LAW. ANY REPRODUCTION, PREPARATION OF DERIVATIVE WORKS, DISTRIBUTION, PUBLIC PERFORMANCE OR DISPLAY, DISCLOSURE, AND/OR USE OF ALL OR ANY PORTION OF THIS PUBLICATION IN ANY FORM OR MEDIUM WITHOUT SPECIFIC WRITTEN AUTHORIZATION FROM FIRST SOLAR IS STRICTLY PROHIBITED.

I:\langan\com\data\EP\0422801\Cadd Data - 100422801\SheetFiles\C320 - Overall Site Plan (Trench Grading).dwg sparent Jul 30, 2014 - 4:57pm



- NOTES:
- REFER TO DRAWING C000 FOR GENERAL NOTES, ABBREVIATIONS, AND LEGEND.
 - SURVEY BASED ON GEOLYSSE "TOPOGRAPHICAL SURVEY AND BOUNDARY SURVEY" DATED 21/02/14. CONTOURS ARE SHOWN AT AN INTERVAL OF 0.2 METRES. CO-ORDINATES ARE MAP GRID AUSTRALIA ZONE 54 (MGA) AND HEIGHTS ARE TO AUSTRALIAN HEIGHT DATUM (AHD).
 - SUBCONTRACTOR LUNCH ROOM TRAILERS WILL BE LOCATED IN THE VICINITY OF THE WORK IN PROGRESS. SEE C100 FOR SCHEMATIC LOCATIONS.
 - EIGHT ADDITIONAL TOILETS (PORTALOOS) WILL BE PROVIDED IN THE VICINITY OF THE WORK IN PROGRESS. SEE C100 FOR SCHEMATIC LOCATIONS.
 - TRAILERS, TANKS, PUMPS, GENERATORS, AND OTHER INFRASTRUCTURE ON SITE ARE TO BE INSTALLED PER VENDOR SPECIFICATIONS. ALL DIMENSIONS, LOCATIONS, ETC. ARE TO BE COORDINATED WITH VENDORS UPON RECEIPT OF FINALIZED VENDOR DRAWINGS.
 - TOILET TRAILERS SHALL BE EQUIPPED WITH SEWAGE STORAGE CONTAINERS. CONTAINERS SHALL BE PROVIDED BY THE TRAILER MANUFACTURER.
 - REFER TO DRAWINGS S811 AND S812 FOR WOOD DECK FRAME DRAWINGS.
 - POTABLE WATER STORAGE TANK TO BE FILLED EVERY 3 DAYS OR MORE FREQUENTLY IF REQUIRED.
 - PARKING SPACE SIZE EXCEEDS AS2890. STALL STRIPING SHOWN IS FOR PLANNING PURPOSES ONLY - PARKING BAYS SHALL NOT BE PAINTED IN FIELD.
 - FINISHED GRADE IN THE MOVE-ON AREA TO MATCH EXISTING GRADE EXCEPT WHERE OTHERWISE NOTED.
 - UNLESS OTHERWISE NOTED, EXISTING GRADE IS EQUAL TO PROPOSED GRADE.
 - MOVE-ON, LAYDOWN, AND O.M. AREA FINISHED GRADES SHALL MATCH EXISTING GRADES UNLESS OTHERWISE NOTED.



REV	DATE	DESCRIPTION	BY	CHK	APP
2	13-05-14	REVISED PER BECA COMMENTS AND CPP LAYDOWN	KMH	SP	RB
1	14-03-14	REVISED PER SURVEY AND 90% AGL/SKM MEETING	KMH	CE	RB
0	10-02-2014	ISSUED FOR CONSTRUCTION	KMH	CE	RB

THIS PRINT IS DESIGNED FOR ISO-A1, (841mm X 594mm) PLOTTING
 THIS PRINT IS NOT TO BE USED FOR CONSTRUCTION UNLESS NOTED AND SIGNED OK FOR CONSTRUCTION ABOVE LAST REVISION.

	FIRST SOLAR ELECTRIC LLC. 400 CROSSING BLVD, 5TH FLOOR BRIDGEWATER, NJ 08807 PHONE: (908) 809-4000 FAX: (908) 809-4020 WWW.FIRSTSOLAR.COM
	DEVELOPER: AGL PV SOLAR DEVELOPMENTS PTY LIMITED

TITLE: **BROKEN HILL SOLAR PARK
 BROKEN HILL, NEW SOUTH WALES
 AUSTRALIA**

PROJECT: **53.76 MWac SOLAR PHOTOVOLTAIC SYSTEM**

SHEET TITLE: **MOVE-ON LAYOUT AND GRADING PLAN**

PROJ. MGR. LOUIS THIROS	PROJ. ENGR. PETER GREEN	DR. BY KMH	CHK. BY RB	DES. BY CE	SCALE 1:500
PROJ. DIRECTOR JIM GIOVAS	SITE CODE	DRAWING No.	REV.		
FIRST SOLAR JOB No. SYS-00061	ABH1	C201	2		

DOCUMENT No. **BH-FS-CI-DWG-0201**

THIS PUBLICATION CONTAINS VALUABLE PROPRIETARY AND CONFIDENTIAL INFORMATION OF FIRST SOLAR, INC. ("FIRST SOLAR") WHICH RETAINS ALL COPYRIGHT RIGHTS TO IT UNDER 17 U.S.C. SECTION 106 AND IS PROTECTED BY U.S. AND INTERNATIONAL LAW. ANY REPRODUCTION, PREPARATION OF DERIVATIVE WORKS, DISTRIBUTION, PUBLIC PERFORMANCE OR DISPLAY, DISCLOSURE, AND/OR USE OF ALL OR ANY PORTION OF THIS PUBLICATION IN ANY FORM OR MEDIUM WITHOUT SPECIFIC WRITTEN AUTHORIZATION FROM FIRST SOLAR IS STRICTLY PROHIBITED.

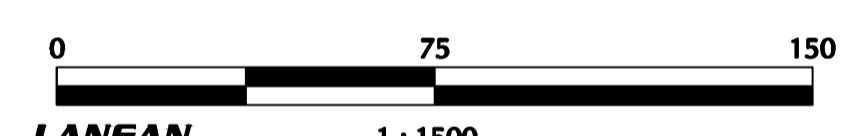


TRAILER SELECTION CHART			
ITEM	MANUFACTURER	CATEGORY	PRODUCT
OH&S Shed	AUSCO	Work (Construction)	Multi-Purpose 12 m x 9 m
Owner Trailer	AUSCO	Work (Construction)	Multi-Purpose 4.8 m x 3 m
First Solar Site Shed	AUSCO	Work (Construction)	Multi-Purpose 12 m x 18 m (equivalent to two 12 m x 9 m combined)
First Solar Lunch Room Trailer	AUSCO	Work (Construction)	Lunchroom 9.6 m x 3 m
First Solar Toilet Trailer	AUSCO	Work (Construction)	Toilet Male/Female 6 m x 3 m
Change Room	AUSCO	Work (Construction)	Multi-Purpose 12 m x 9 m
Toilet Trailers	AUSCO	Work (Construction)	Abolition Block 6 m x 3 m
Lunchroom (located around site)	AUSCO	Work (Construction)	Lunchroom 12 m x 3 m
Toilet Trailers (located around site)	AUSCO	Work (Construction)	Portaloos 1.2 m x 1.2 m

Note: Interior fit-out to be coordinated with First Solar Construction Manager.
Source: <http://www.ausco.com.au/products-services/hire/work/construction>

TRAILER SIZING CHART		
ITEM	REQUIRED	PROVIDED
Number of Construction Labourers		175
Lunch Room:		
Minimum Area	1 square metre per 1 person at one any time 25 employees at any time = 25 square metres	28.8 square metres (9.6 metres x 3 metres, 30 seats)
Change Room		
Minimum Area	0.5 square metre per 1 person = 87.5 square metres	108 square metres (12 metres x 9 metres)
Showers		
Minimum Area	1 shower per 25 persons = 7 showers	12 showers (9 male, 3 female)
Toilet Trailers		
Minimum Number of Toilets	1 toilet per 20 males (assume 160) 1 toilet per 10 females (assume 15) = 8 toilets (male), 2 toilets (female) = 10 total	Min. 20 (9 male, 3 female in vicinity of change room plus 8 portaloos to be placed throughout site)

- NOTES:
- REFER TO DRAWING C000 FOR GENERAL NOTES, ABBREVIATIONS, AND LEGEND.
 - SURVEY BASED ON GEOLYSE "TOPOGRAPHICAL SURVEY AND BOUNDARY SURVEY" DATED 31/02/14. CONTOURS ARE SHOWN AT AN INTERVAL OF 0.2 METRES. CO-ORDINATES ARE MAP GRID AUSTRALIA ZONE 54 (MGA) AND HEIGHTS ARE TO AUSTRALIAN HEIGHT DATUM (AHD).
 - EIGHT ADDITIONAL LUNCHROOM AND TOILET TRAILER LOCATIONS WILL BE PROVIDED IN THE FIELD NEAR THE VICINITY OF THE WORK AREA. SEE C100 FOR SCHEMATIC LOCATIONS.
 - EIGHT ADDITIONAL TOILETS (PORTALOOS) WILL BE PROVIDED IN THE VICINITY OF THE WORK IN PROGRESS. SEE C100 FOR SCHEMATIC LOCATIONS.
 - TRAILERS, TANKS, PUMPS, GENERATORS, AND OTHER INFRASTRUCTURE ON SITE ARE TO BE INSTALLED PER VENDOR SPECIFICATIONS. ALL DIMENSIONS, LOCATIONS, ETC. ARE TO BE COORDINATED WITH VENDORS UPON RECEIPT OF FINALIZED VENDOR DRAWINGS.
 - TOILET TRAILERS SHALL BE EQUIPPED WITH SEWAGE STORAGE CONTAINERS. CONTAINERS SHALL BE PROVIDED BY THE TRAILER MANUFACTURER.
 - POTABLE WATER STORAGE TANK TO BE FILLED EVERY 3 DAYS OR MORE FREQUENTLY IF REQUIRED.
 - PARKING SPACE SIZE EXCEEDS AS2890. BAY STRIPING SHOWN IS FOR PLANNING PURPOSES ONLY - PARKING BAYS SHALL NOT BE PAINTED IN FIELD.



REV	DATE	DESCRIPTION	BY	CHK	APP
2	13-05-14	REVISED PER BECA COMMENTS AND CPP LAYDOWN	KMH	SP	RB
1	14-03-14	REVISED PER SURVEY AND 90% AGL/SKM MEETING	KMH	CE	RB
0	10-02-2014	ISSUED FOR CONSTRUCTION	KMH	CE	RB

THIS PRINT IS DESIGNED FOR ISO-A1, (841mm X 594mm) PLOTTING
THIS PRINT IS NOT TO BE USED FOR CONSTRUCTION UNLESS NOTED AND SIGNED OK FOR CONSTRUCTION ABOVE LAST REVISION.

FIRST SOLAR ELECTRIC LLC.
400 CROSSING BLVD, 5TH FLOOR
BRIDGEWATER, NJ 08807
PHONE: (908) 809-4000
FAX: (908) 809-4020
WWW.FIRST-SOLAR.COM

DEVELOPER:
AGL PV SOLAR DEVELOPMENTS PTY LIMITED

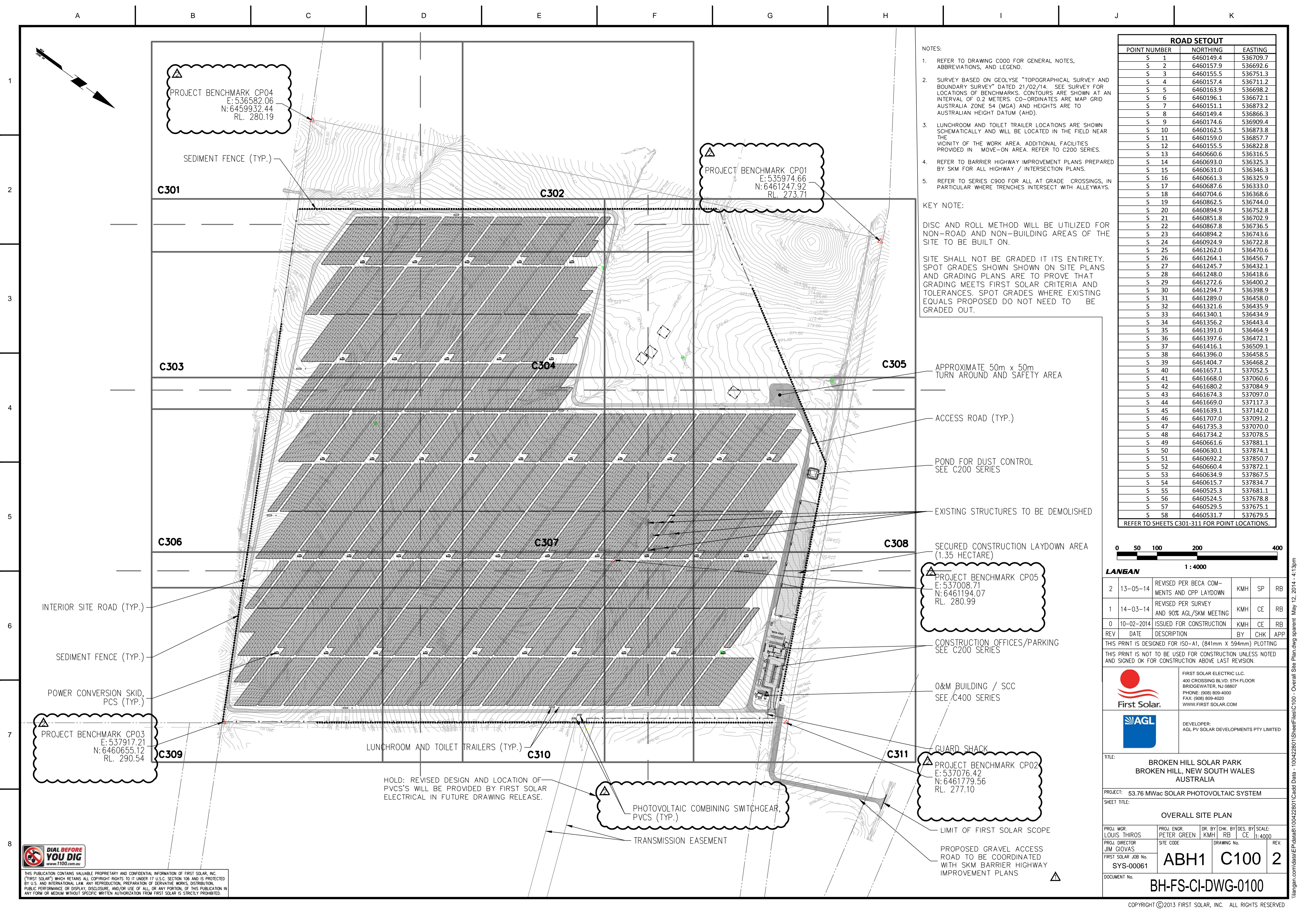
TITLE: **BROKEN HILL SOLAR PARK
BROKEN HILL, NEW SOUTH WALES
AUSTRALIA**

PROJECT: **53.76 MWac SOLAR PHOTOVOLTAIC SYSTEM**

SHEET TITLE: **OVERALL MOVE-ON LAYOUT PLAN**

PROJ. MGR. LOUIS THIROS	PROJ. ENGR. PETER GREEN	DR. BY KMH	CHK. BY RB	DES. BY CE	SCALE: 1:1500
PROJ. DIRECTOR JIM GIOVAS	SITE CODE ABH1	DRAWING No. C200	REV. 2		
FIRST SOLAR JOB No. SYS-00061	DOCUMENT No. BH-FS-CI-DWG-0200				

THIS PUBLICATION CONTAINS VALUABLE PROPRIETARY AND CONFIDENTIAL INFORMATION OF FIRST SOLAR, INC. ("FIRST SOLAR") WHICH RETAINS ALL COPYRIGHT RIGHTS TO IT UNDER 17 U.S.C. SECTION 106 AND IS PROTECTED BY U.S. AND INTERNATIONAL LAW. ANY REPRODUCTION, PREPARATION OF DERIVATIVE WORKS, DISTRIBUTION, PUBLIC PERFORMANCE OR DISPLAY, DISCLOSURE, AND/OR USE OF ALL OR ANY PORTION OF THIS PUBLICATION IN ANY FORM OR MEDIUM WITHOUT SPECIFIC WRITTEN AUTHORIZATION FROM FIRST SOLAR IS STRICTLY PROHIBITED.



- NOTES:
- REFER TO DRAWING C000 FOR GENERAL NOTES, ABBREVIATIONS, AND LEGEND.
 - SURVEY BASED ON GEOLYSE "TOPOGRAPHICAL SURVEY AND BOUNDARY SURVEY" DATED 21/02/14. SEE SURVEY FOR LOCATIONS OF BENCHMARKS. CONTOURS ARE SHOWN AT AN INTERVAL OF 0.2 METERS. CO-ORDINATES ARE MAP GRID AUSTRALIA ZONE 54 (MGA) AND HEIGHTS ARE TO AUSTRALIAN HEIGHT DATUM (AHD).
 - LUNCHROOM AND TOILET TRAILER LOCATIONS ARE SHOWN SCHEMATICALLY AND WILL BE LOCATED IN THE FIELD NEAR THE VICINITY OF THE WORK AREA. ADDITIONAL FACILITIES PROVIDED IN MOVE-ON AREA. REFER TO C200 SERIES.
 - REFER TO BARRIER HIGHWAY IMPROVEMENT PLANS PREPARED BY SKM FOR ALL HIGHWAY / INTERSECTION PLANS.
 - REFER TO SERIES C900 FOR ALL AT GRADE CROSSINGS, IN PARTICULAR WHERE TRENCHES INTERSECT WITH ALLEYS.

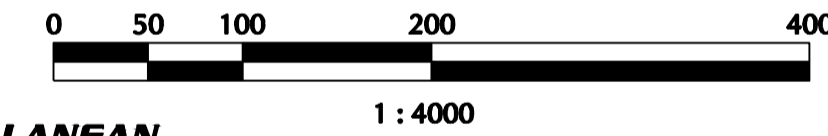
KEY NOTE:

DISC AND ROLL METHOD WILL BE UTILIZED FOR NON-ROAD AND NON-BUILDING AREAS OF THE SITE TO BE BUILT ON.

SITE SHALL NOT BE GRADED IT ITS ENTIRETY. SPOT GRADES SHOWN SHOWN ON SITE PLANS AND GRADING PLANS ARE TO PROVE THAT GRADING MEETS FIRST SOLAR CRITERIA AND TOLERANCES. SPOT GRADES WHERE EXISTING EQUALS PROPOSED DO NOT NEED TO BE GRADED OUT.

ROAD SETOUT		
POINT NUMBER	NORTHING	EASTING
S 1	6460149.4	536709.7
S 2	6460157.9	536692.6
S 3	6460155.5	536751.3
S 4	6460157.4	536711.2
S 5	6460163.9	536698.2
S 6	6460196.1	536672.1
S 7	6460151.1	536873.2
S 8	6460149.4	536866.3
S 9	6460174.6	536909.4
S 10	6460162.5	536873.8
S 11	6460159.0	536857.7
S 12	6460155.5	536822.8
S 13	6460660.6	536316.5
S 14	6460693.0	536325.3
S 15	6460631.0	536346.3
S 16	6460661.3	536325.9
S 17	6460687.6	536333.0
S 18	6460704.6	536368.6
S 19	6460862.5	536744.0
S 20	6460894.9	536752.8
S 21	6460851.8	536702.9
S 22	6460867.8	536736.5
S 23	6460894.2	536743.6
S 24	6460924.9	536722.8
S 25	6461262.0	536470.6
S 26	6461264.1	536456.7
S 27	6461245.7	536432.1
S 28	6461248.0	536418.6
S 29	6461272.6	536400.2
S 30	6461294.7	536398.9
S 31	6461289.0	536458.0
S 32	6461321.6	536435.9
S 33	6461340.1	536434.9
S 34	6461356.2	536443.4
S 35	6461391.0	536464.9
S 36	6461397.6	536472.1
S 37	6461416.1	536509.1
S 38	6461396.0	536458.5
S 39	6461404.7	536468.2
S 40	6461657.1	537052.5
S 41	6461668.0	537060.6
S 42	6461680.2	537084.9
S 43	6461674.3	537097.0
S 44	6461669.0	537117.3
S 45	6461639.1	537142.0
S 46	6461707.0	537091.2
S 47	6461735.3	537070.0
S 48	6461734.2	537078.5
S 49	6460661.6	537881.1
S 50	6460630.1	537874.1
S 51	6460692.2	537850.7
S 52	6460660.4	537872.1
S 53	6460634.9	537867.5
S 54	6460615.7	537834.7
S 55	6460525.3	537681.1
S 56	6460524.5	537678.8
S 57	6460529.5	537675.1
S 58	6460531.7	537679.5

REFER TO SHEETS C301-311 FOR POINT LOCATIONS.



REV	DATE	DESCRIPTION	BY	CHK	APP
2	13-05-14	REVISED PER BECA COMMENTS AND CPP LAYDOWN	KMH	SP	RB
1	14-03-14	REVISED PER SURVEY AND 90% AGL/SKM MEETING	KMH	CE	RB
0	10-02-2014	ISSUED FOR CONSTRUCTION	KMH	CE	RB

THIS PRINT IS DESIGNED FOR ISO-A1, (841mm X 594mm) PLOTTING
 THIS PRINT IS NOT TO BE USED FOR CONSTRUCTION UNLESS NOTED AND SIGNED OK FOR CONSTRUCTION ABOVE LAST REVISION.

First Solar.
 FIRST SOLAR ELECTRIC LLC.
 400 CROSSING BLVD, 5TH FLOOR
 BRIDGEWATER, NJ 08807
 PHONE: (908) 809-4000
 FAX: (908) 809-4020
 WWW.FIRSTSOLAR.COM

AGL
 DEVELOPER:
 AGL PV SOLAR DEVELOPMENTS PTY LIMITED

TITLE: **BROKEN HILL SOLAR PARK
 BROKEN HILL, NEW SOUTH WALES
 AUSTRALIA**

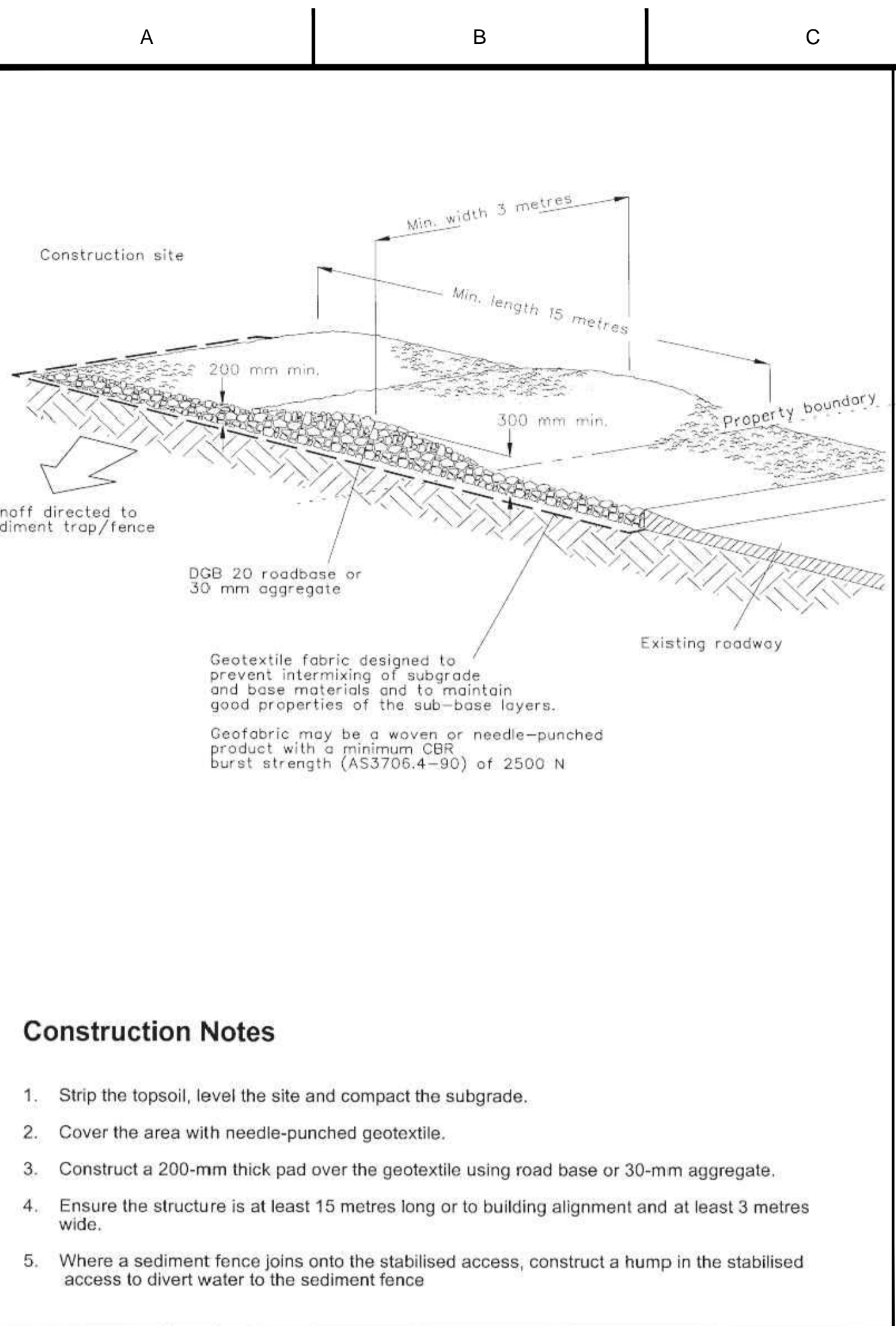
PROJECT: **53.76 MWac SOLAR PHOTOVOLTAIC SYSTEM**

OVERALL SITE PLAN					
PROJ. MGR.	PROJ. ENGR.	DR. BY	CHK. BY	DES. BY	SCALE:
LOUIS THIROIS	PETER GREEN	KMH	RB	CE	1:4000
PROJ. DIRECTOR	SITE CODE	DRAWING No.	REV.		
JIM GIOVAS					
FIRST SOLAR JOB No.	ABH1	C100	2		
SYS-00061					

DOCUMENT No. **BH-FS-CI-DWG-0100**

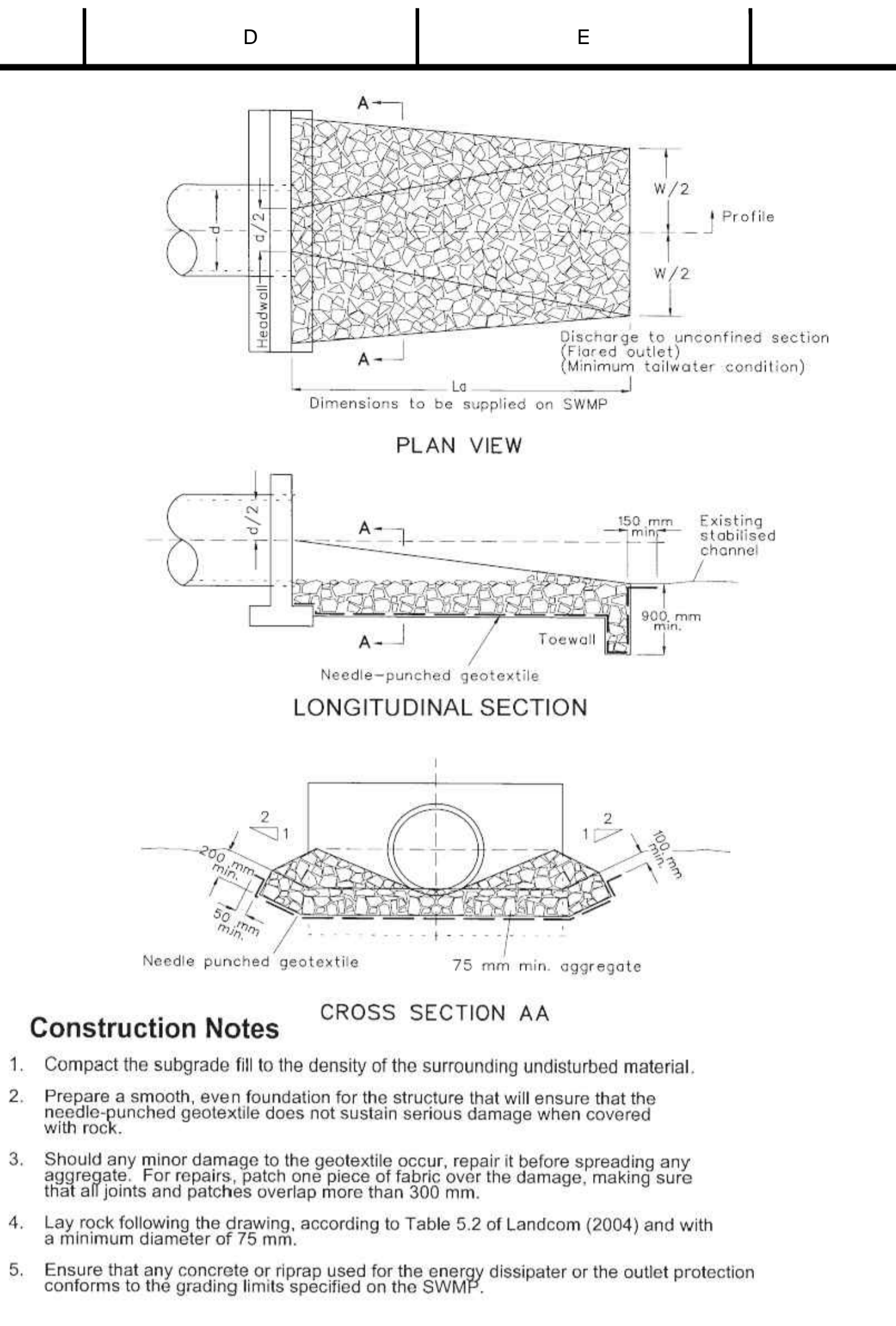
DIAL BEFORE YOU DIG
 www.1100.com.au

THIS PUBLICATION CONTAINS VALUABLE PROPRIETARY AND CONFIDENTIAL INFORMATION OF FIRST SOLAR, INC. ("FIRST SOLAR") WHICH RETAINS ALL COPYRIGHT RIGHTS TO IT UNDER 17 U.S.C. SECTION 106 AND IS PROTECTED BY U.S. AND INTERNATIONAL LAW. ANY REPRODUCTION, PREPARATION OF DERIVATIVE WORKS, DISTRIBUTION, PUBLIC PERFORMANCE OR DISPLAY, DISCLOSURE, AND/OR USE OF ALL OR ANY PORTION OF THIS PUBLICATION IN ANY FORM OR MEDIUM WITHOUT SPECIFIC WRITTEN AUTHORIZATION FROM FIRST SOLAR IS STRICTLY PROHIBITED.



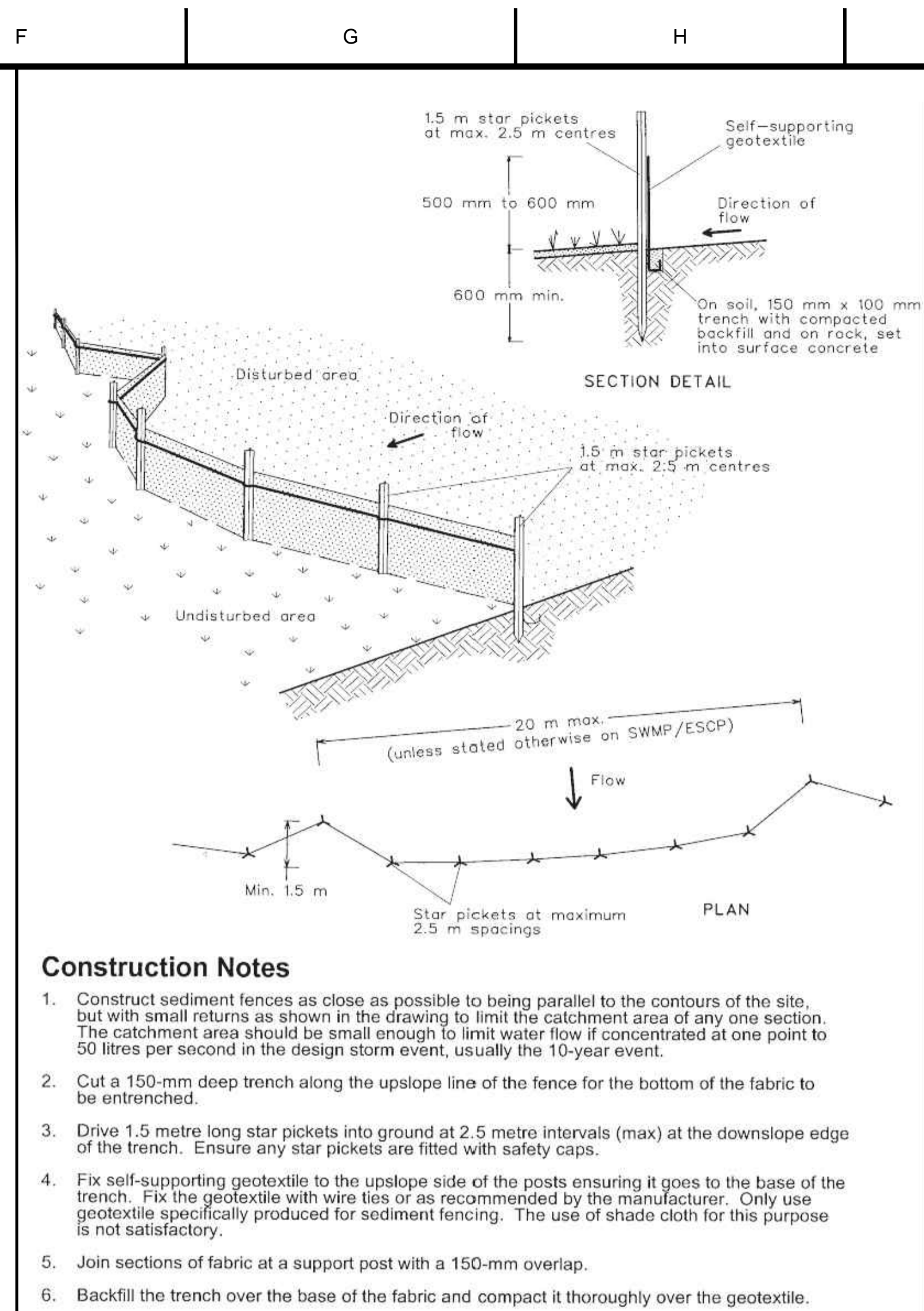
Construction Notes

- Strip the topsoil, level the site and compact the subgrade.
- Cover the area with needle-punched geotextile.
- Construct a 200-mm thick pad over the geotextile using road base or 30-mm aggregate.
- Ensure the structure is at least 15 metres long or to building alignment and at least 3 metres wide.
- Where a sediment fence joins onto the stabilised access, construct a hump in the stabilised access to divert water to the sediment fence



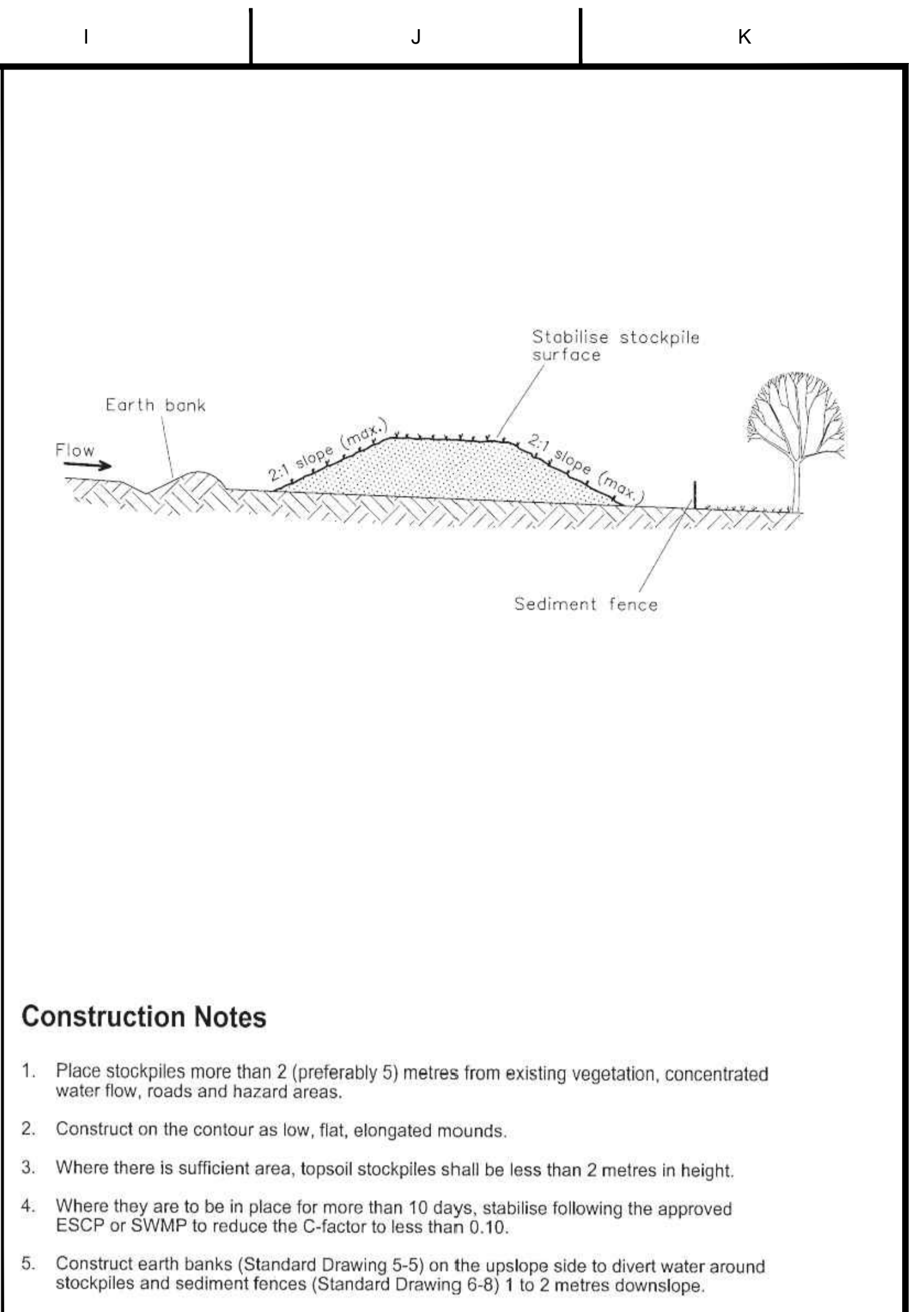
Construction Notes

- Compact the subgrade fill to the density of the surrounding undisturbed material.
- Prepare a smooth, even foundation for the structure that will ensure that the needle-punched geotextile does not sustain serious damage when covered with rock.
- Should any minor damage to the geotextile occur, repair it before spreading any aggregate. For repairs, patch one piece of fabric over the damage, making sure that all joints and patches overlap more than 300 mm.
- Lay rock following the drawing, according to Table 5.2 of Landcom (2004) and with a minimum diameter of 75 mm.
- Ensure that any concrete or riprap used for the energy dissipater or the outlet protection conforms to the grading limits specified on the SWMP.



Construction Notes

- Construct sediment fences as close as possible to being parallel to the contours of the site, but with small returns as shown in the drawing to limit the catchment area of any one section. The catchment area should be small enough to limit water flow if concentrated at one point to 50 litres per second in the design storm event, usually the 10-year event.
- Cut a 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
- Drive 1.5 metre long star pickets into ground at 2.5 metre intervals (max) at the downslope edge of the trench. Ensure any star pickets are fitted with safety caps.
- Fix self-supporting geotextile to the upslope side of the posts ensuring it goes to the base of the trench. Fix the geotextile with wire ties or as recommended by the manufacturer. Only use geotextile specifically produced for sediment fencing. The use of shade cloth for this purpose is not satisfactory.
- Join sections of fabric at a support post with a 150-mm overlap.
- Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile.



Construction Notes

- Place stockpiles more than 2 (preferably 5) metres from existing vegetation, concentrated water flow, roads and hazard areas.
- Construct on the contour as low, flat, elongated mounds.
- Where there is sufficient area, topsoil stockpiles shall be less than 2 metres in height.
- Where they are to be in place for more than 10 days, stabilise following the approved ESCP or SWMP to reduce the C-factor to less than 0.10.
- Construct earth banks (Standard Drawing 5-5) on the upslope side to divert water around stockpiles and sediment fences (Standard Drawing 6-8) 1 to 2 metres downslope.

STABILISED SITE ACCESS SD 6-14

ENERGY DISSIPATER SD 5-8

SEDIMENT FENCE SD 6-8

STOCKPILES SD 4-1

<p>LANGAN</p> <table border="1"> <tr> <td>3</td> <td>27-05-14</td> <td>REVISED PER CPP LAYDOWN AND DUST POND VOLUME</td> <td>RS</td> <td>SP</td> <td>RB</td> </tr> <tr> <td>2</td> <td>13-05-14</td> <td>REVISED PER BECA COMMENTS AND CPP LAYDOWN</td> <td>KMH</td> <td>SP</td> <td>RB</td> </tr> <tr> <td>1</td> <td>14-03-14</td> <td>REVISED PER SURVEY AND 90% AGL/SKM MEETING</td> <td>KMH</td> <td>CE</td> <td>RB</td> </tr> <tr> <td>0</td> <td>10-02-2014</td> <td>ISSUED FOR CONSTRUCTION</td> <td>KMH</td> <td>CE</td> <td>RB</td> </tr> <tr> <td>REV</td> <td>DATE</td> <td>DESCRIPTION</td> <td>BY</td> <td>CHK</td> <td>APP</td> </tr> </table> <p>THIS PRINT IS DESIGNED FOR ISO-A1, (841mm X 594mm) PLOTTING THIS PRINT IS NOT TO BE USED FOR CONSTRUCTION UNLESS NOTED AND SIGNED OK FOR CONSTRUCTION ABOVE LAST REVISION.</p> <table border="1"> <tr> <td></td> <td>FIRST SOLAR ELECTRIC LLC. 400 CROSSING BLVD, 5TH FLOOR BRIDGEWATER, NJ 08807 PHONE: (908) 809-4000 FAX: (908) 809-4020 WWW.FIRSTSOLAR.COM</td> </tr> <tr> <td></td> <td>DEVELOPER: AGL PV SOLAR DEVELOPMENTS PTY LIMITED</td> </tr> </table> <p>TITLE: BROKEN HILL SOLAR PARK BROKEN HILL, NEW SOUTH WALES AUSTRALIA</p> <p>PROJECT: 53.76 MWac SOLAR PHOTOVOLTAIC SYSTEM</p> <p>SHEET TITLE: SOIL AND WATER MANAGEMENT DETAILS</p> <table border="1"> <tr> <td>PROJ. MGR. LOUIS THIROS</td> <td>PROJ. ENGR. PETER GREEN</td> <td>DR. BY KMH</td> <td>CHK. BY RB</td> <td>DES. BY CE</td> <td>SCALE: -</td> </tr> <tr> <td>PROJ. DIRECTOR JIM GIOVAS</td> <td>SITE CODE ABH1</td> <td>DRAWING No. C811</td> <td>REV. 3</td> <td colspan="2"></td> </tr> <tr> <td>FIRST SOLAR JOB No. SYS-00061</td> <td colspan="5">DOCUMENT No. BH-FS-CI-DWG-0811</td> </tr> </table>				3	27-05-14	REVISED PER CPP LAYDOWN AND DUST POND VOLUME	RS	SP	RB	2	13-05-14	REVISED PER BECA COMMENTS AND CPP LAYDOWN	KMH	SP	RB	1	14-03-14	REVISED PER SURVEY AND 90% AGL/SKM MEETING	KMH	CE	RB	0	10-02-2014	ISSUED FOR CONSTRUCTION	KMH	CE	RB	REV	DATE	DESCRIPTION	BY	CHK	APP		FIRST SOLAR ELECTRIC LLC. 400 CROSSING BLVD, 5TH FLOOR BRIDGEWATER, NJ 08807 PHONE: (908) 809-4000 FAX: (908) 809-4020 WWW.FIRSTSOLAR.COM		DEVELOPER: AGL PV SOLAR DEVELOPMENTS PTY LIMITED	PROJ. MGR. LOUIS THIROS	PROJ. ENGR. PETER GREEN	DR. BY KMH	CHK. BY RB	DES. BY CE	SCALE: -	PROJ. DIRECTOR JIM GIOVAS	SITE CODE ABH1	DRAWING No. C811	REV. 3			FIRST SOLAR JOB No. SYS-00061	DOCUMENT No. BH-FS-CI-DWG-0811				
3	27-05-14	REVISED PER CPP LAYDOWN AND DUST POND VOLUME	RS	SP	RB																																																		
2	13-05-14	REVISED PER BECA COMMENTS AND CPP LAYDOWN	KMH	SP	RB																																																		
1	14-03-14	REVISED PER SURVEY AND 90% AGL/SKM MEETING	KMH	CE	RB																																																		
0	10-02-2014	ISSUED FOR CONSTRUCTION	KMH	CE	RB																																																		
REV	DATE	DESCRIPTION	BY	CHK	APP																																																		
	FIRST SOLAR ELECTRIC LLC. 400 CROSSING BLVD, 5TH FLOOR BRIDGEWATER, NJ 08807 PHONE: (908) 809-4000 FAX: (908) 809-4020 WWW.FIRSTSOLAR.COM																																																						
	DEVELOPER: AGL PV SOLAR DEVELOPMENTS PTY LIMITED																																																						
PROJ. MGR. LOUIS THIROS	PROJ. ENGR. PETER GREEN	DR. BY KMH	CHK. BY RB	DES. BY CE	SCALE: -																																																		
PROJ. DIRECTOR JIM GIOVAS	SITE CODE ABH1	DRAWING No. C811	REV. 3																																																				
FIRST SOLAR JOB No. SYS-00061	DOCUMENT No. BH-FS-CI-DWG-0811																																																						

DIAL BEFORE YOU DIG
www.1100.com.au

THIS PUBLICATION CONTAINS VALUABLE PROPRIETARY AND CONFIDENTIAL INFORMATION OF FIRST SOLAR, INC. ("FIRST SOLAR") WHICH RETAINS ALL COPYRIGHT RIGHTS TO IT UNDER 17 U.S.C. SECTION 106 AND IS PROTECTED BY U.S. AND INTERNATIONAL LAW. ANY REPRODUCTION, PREPARATION OF DERIVATIVE WORKS, DISTRIBUTION, PUBLIC PERFORMANCE OR DISPLAY, DISCLOSURE, AND/OR USE OF ALL OR ANY PORTION OF THIS PUBLICATION IN ANY FORM OR MEDIUM WITHOUT SPECIFIC WRITTEN AUTHORIZATION FROM FIRST SOLAR IS STRICTLY PROHIBITED.

SAFETY NOTES

- SAFETY AND ENVIRONMENTAL RESPONSIBILITY ARE THE TOP TWO CORE VALUES OF THE CONTRACTOR. SUB-CONTRACTOR SHALL PERFORM ALL WORK IN A SAFE AND RESPONSIBLE MANNER.
- THE SUB-CONTRACTOR SHALL COMPLY TO THE FULLEST EXTENT WITH THE LATEST STATE OR TERRITORY, OHS STANDARDS AND REGULATIONS, OR ANY OTHER AGENCY HAVING JURISDICTION FOR EXCAVATION AND TRENCHING PROCEDURES. THE SUB-CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE "MEANS AND METHODS" REQUIRED TO MEET THE INTENT AND PERFORMANCE CRITERIA OF STATE OR TERRITORY, OHS, AS WELL AS ANY OTHER ENTITY THAT HAS JURISDICTION FOR EXCAVATION AND/OR TRENCHING PROCEDURES.
- ALL SAFETY MEASURES TO BE IN ACCORDANCE WITH FIRST SOLAR SAFETY MANAGEMENT SYSTEM.

ENVIRONMENTAL NOTES

- REFER TO "BROKEN HILL SOLAR PLANT: ENVIRONMENTAL ASSESSMENT" BY SINCLAIR KNIGHT MERZ DATED OCTOBER 2012.
- ALL SOIL AND WATER MANAGEMENT MEASURES SHALL BE IN PLACE PRIOR TO START OF GRADING OPERATIONS. THESE MEASURES SHALL BE MONITORED DURING CONSTRUCTION, REPAIRED AS REQUIRED AFTER EVERY SIGNIFICANT RAINFALL AND REMOVED AFTER CONSTRUCTION IS COMPLETE. REFER TO THE SWMP FOR EROSION CONTROL MEASURES.
- CLEARING AND GRUBBING SHALL BE PERFORMED ONLY IN AREAS TO BE DISTURBED AS DEFINED WITHIN THE LIMITS OF DISTURBANCE AS SHOWN ON THE SWMP.
- SUB-CONTRACTOR SHALL UTILIZE ADEQUATE SAFEGUARDS TO MINIMIZE DUST, SEDIMENT, EROSION AND NOISE DUE TO DEMOLITION AND CONSTRUCTION ACTIVITIES.
- IF ANY HISTORICAL ARTIFACTS ARE DISCOVERED DURING CONSTRUCTION, SUB-CONTRACTOR SHALL IMMEDIATELY STOP RELATED WORK AND NOTIFY FIRST SOLAR. WORK SHALL NOT RESUME UNLESS CLEARANCE TO RESUME WORK HAS BEEN PROVIDED BY FIRST SOLAR.

SURVEY NOTES

- TEMPORARY BENCHMARK(S) HAVE BEEN ESTABLISHED. COORDINATES, AND ELEVATIONS, FOR THESE BENCHMARK(S) ARE PROVIDED. SUB-CONTRACTOR SHALL USE THE NEAREST GAZETTE PERMANENT GEODETIC SURVEY MARK TO DETERMINE THE LOCATIONS FOR ALL REQUIRED WORK.
- ALL SURVEY WORK SHALL BE PERFORMED UNDER THE SUPERVISION OF A SURVEYOR LICENSED IN THE STATE OR TERRITORY WHERE THE WORK IS BEING PERFORMED.

CONTRACT NOTES

- IN CASES OF CONFLICT IN INFORMATION, OR MISSING INFORMATION, SUB-CONTRACTOR SHALL CONTACT THE CONTRACTOR AND OBTAIN CLARIFICATION(S), BEFORE PROCEEDING WITH THE WORK.
- CIVIL DRAWINGS SHALL BE USED TOGETHER WITH SPECIFICATIONS, STRUCTURAL AND ELECTRICAL DRAWINGS, AS APPLICABLE.
- CIVIL WORKS SHALL BE PERFORMED IN ACCORDANCE WITH AGL AGREEMENT, LOCAL SHIRE COUNCIL REQUIREMENTS AND APPLICABLE AUSTRALIAN STANDARDS.
- COPIES OF CONTRACT DRAWINGS SHALL NOT BE USED FOR SUBMISSION AS SHOP DRAWINGS. ALL REVISIONS SHALL BE IDENTIFIED ON THE SHOP DRAWINGS ON EACH SUBMISSION.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SITE PREPARATION PER CONTRACT SCOPE.
- SUB-CONTRACTOR IS RESPONSIBLE FOR ALL ITEMS OF CONSTRUCTION INDICATED ON THE CONTRACT DRAWINGS. SUBMISSION OF SHOP DRAWINGS FOR PARTIAL ITEMS OF WORK DOES NOT RELIEVE SUB-CONTRACTOR FOR BALANCE OF ITEMS ON CONTRACT DRAWINGS.
- CONSTRUCTION SHALL BE BASED ON DIMENSIONS SHOWN ON THE DRAWINGS. DRAWINGS SHALL NOT BE SCALED.
- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE APPLICABLE FEDERAL, STATE (OR TERRITORY) LAW AND LOCAL CODES
- ANY ADDITIONAL PERMITS SHALL BE OBTAINED BY THE SUB-CONTRACTOR
- LOCATIONS OF EXISTING CONDITIONS SHOWN ON DRAWINGS ARE BASED ON INFORMATION AVAILABLE AT THE TIME OF PREPARATION OF DRAWINGS, AND SHOULD BE CONSIDERED APPROXIMATE.

- SUB-CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, LOCATIONS, ELEVATIONS, AND DIMENSIONS PRIOR TO START OF WORK. SUB-CONTRACTOR SHALL NOTIFY FIRST SOLAR OF ANY DISCREPANCIES OR PROBLEMS WHICH COULD INTERFERE WITH SATISFACTORY COMPLETION OF THE WORK.
- CONTRACT DRAWINGS HAVE BEEN PREPARED BASED ON CURRENTLY AVAILABLE INFORMATION. ACTUAL FIELD CONDITIONS MAY REQUIRE MODIFICATIONS TO CONSTRUCTION DETAILS. SUB-CONTRACTOR SHALL NOTIFY FIRST SOLAR OF DIFFERING CONDITIONS, AND PERFORM WORK, BASED ON ACTUAL FIELD CONDITIONS, AS DIRECTED BY FIRST SOLAR.
- SUB-CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT DAMAGE TO ANY ITEMS NOT INCLUDED IN THE SCOPE OF WORK, INCLUDING, BUT NOT LIMITED TO, EXISTING UTILITIES, BENCHMARKS, MARKERS, IMPROVEMENTS, EQUIPMENT, STRUCTURES, ROADS AND PARKING AREAS. ANY DAMAGE CAUSED BY SUB-CONTRACTOR SHALL BE REPAIRED BY SUB-CONTRACTOR, AS APPROVED BY FIRST SOLAR AND/OR OTHER PARTIES AT NO ADDITIONAL COST TO FIRST SOLAR.
- SUB-CONTRACTOR SHALL LIMIT ALL WORK ACTIVITIES INCLUDING CONSTRUCTION STAGING, PARKING, LAYDOWN, ETC. TO BE INSIDE THE DEFINED PROPERTY LIMITS.
- SUB-CONTRACTOR TO NOTIFY FIRST SOLAR TWO (2) WORKING DAYS PRIOR OF ANY WORK TO BE PERFORMED OUTSIDE THE PROJECT LIMITS.
- EXCAVATIONS SHALL BE CARRIED OUT TO THE ELEVATIONS SHOWN ON THE CONTRACT DRAWINGS. ANY EXCAVATION CARRIED TO DEPTHS BELOW THOSE SHOWN ON THE DRAWINGS, AND NOT AUTHORIZED BY FIRST SOLAR, SHALL BE BACKFILLED WITH STRUCTURAL FILL AT NO ADDITIONAL COST TO FIRST SOLAR.
- ANY ADDITIONAL DEMOLITION OR CONSTRUCTION, NOT SHOWN ON DRAWINGS AND PERFORMED FOR CONSTRUCTION CONVENIENCE, SHALL BE RESTORED TO ITS ORIGINAL CONDITION, AS APPROVED BY FIRST SOLAR, AND AT NO ADDITIONAL COST TO FIRST SOLAR.
- SUB-CONTRACTOR SHALL PROVIDE NECESSARY DEWATERING OF EXCAVATION SUCH THAT CONSTRUCTION CAN BE PERFORMED UNDER DRY CONDITIONS.
- WHERE GRADING IS PROPOSED, FINAL GRADED SLOPES SHALL BE UNIFORM BETWEEN SPECIFIED CONTOURS AND/OR SPOT ELEVATIONS.
- ALL CLEARED AND/OR GRUBBED AREAS, EXCEPT AREAS COVERED WITH CRUSHED ROCK OR PAVING SHALL BE SEEDED AND MULCHED. SUB-CONTRACTOR SHALL MAINTAIN SEEDED AREAS UNTIL FACILITY ACCEPTANCE.
- REFER TO CEMP FOR ADDITIONAL IMPROVEMENTS RELATED TO LANDSCAPING, GROUNDCOVER MANAGEMENT, ETC.
- CONTRACTOR SHALL TAKE APPROPRIATE MEASURES, INCLUDING DEWATERING DUE TO STORM WATER, TO PREVENT THE FOUNDATION AND TRENCHED AREAS FROM BECOMING DESTABILIZED.
- ALL SITE DEVELOPMENT AREAS DISTURBED DURING CONSTRUCTION, INCLUDING LAYDOWN, PARKING, AND TEMPORARY OFFICE TRAILERS, ETC. SHALL BE RESTORED AND STABILIZED IN ACCORDANCE WITH THE CEMP AND APPROVED CIVIL DESIGN.
- ALL HARD STAND AREAS AND AREAS AROUND STRUCTURES AND BUILDINGS SHALL BE SUFFICIENTLY COMPACTED AND WEATHER RESISTANT TO BE OPERATIONAL WITH MINIMUM MAINTENANCE.
- SUB-CONTRACTOR SHALL NOTIFY DIAL BEFORE YOU DIG 5 DAYS PRIOR TO START OF CONSTRUCTION.
- SUB-CONTRACTOR SHALL NOTIFY ALL PUBLIC UTILITY COMPANIES, AND OWNERS OF PRIVATE UTILITIES, WITHIN THE SITE AREA PRIOR TO START OF CONSTRUCTION.
- SUB-CONTRACTOR SHALL NOTIFY THE RESPONSIBLE AUTHORITIES ENGINEERING DEPARTMENT, IN WRITING, A MINIMUM OF 5 DAYS IN ADVANCE, PRIOR TO PERFORMING ANY WORK ON LOCAL/STATE OR TERRITORY ROADS.
- AFTER COMPLETION OF WORK, ALL EXISTING AND TEMPORARY UTILITY SERVICES THAT WILL NOT BE FURTHER REQUIRED, SHALL BE ABANDONED AS PER THE RESPONSIBLE AUTHORITIES REGULATIONS AND/OR UTILITY PROVIDER REQUIREMENTS.
- THE SCC AND OPERATIONS & MAINTENANCE BUILDING MANUFACTURERS SHOULD PROVIDE LIGHTING IN ACCORDANCE WITH AS1158 AND THE BCA.

SITE SPECIFIC NOTES:

- REFER TO THE SITE SPECIFIC CEMP. SUB-CONTRACTOR SHALL IMPLEMENT ALL REQUIREMENTS OF THE CEMP AND BEST MANAGEMENT PRACTICES (BMP) FOR THE DURATION OF THE PROJECT. BMP SHALL INCLUDE STABILIZED CONSTRUCTION ACCESS, EROSION PROTECTION, PROTECTION OF ON-SITE MATERIALS, WASHOUT PITS, CONTROL OF PERIMETER WITH SILT FENCING, DRY STREET SWEEPING ETC.
- ELEVATIONS SHOWN ON C300 SERIES ARE BASED ON SURVEY BASED ON GEOLYSE "TOPOGRAPHICAL SURVEY AND BOUNDARY SURVEY" DATED 21/02/14. PCS ELEVATIONS SHOWN INDICATE THE GROUND ELEVATION (GE) AND THE MINIMUM EQUIPMENT ELEVATION (EE).

42. GEOTECHNICAL NOTES:

- REFER TO GEOTECHNICAL INVESTIGATION AND PILE TESTING FINAL REPORT PREPARED BY GOLDER ASSOCIATES.
- THE FOLLOWING SITE PREPARATION AND EARTHWORKS PROCEDURES SHALL BE PROVIDED FOR THE PERIMETER, INTERNAL, AND ACCESS ROADS AS WELL AS CONSTRUCTION PLATFORMS:
 - STRIP FILL, TOPSOIL OR ROOT AFFECTED ZONES FROM THE PAVEMENT FOOTPRINT AND EXCAVATE TO DESIGN SUBGRADE LEVEL WHERE REQUIRED
 - AS A MINIMUM, EXPOSED SUBGRADE SHALL FIRST BE COMPACTED/PROOF-ROLLED WITH AT LEAST 8 PASSES OF A MINIMUM 15-TONNE ROLLER. ALTERNATIVELY, AN IMPACT ROLLER COULD BE USED TO ATTEMPT IMPROVEMENT OF THE DISTURBED SOILS.
 - SOFT, HEAVING OR UNSUITABLE MATERIALS SHALL BE REMOVED AND REPLACED WITH SUITABLE FILL AS DESCRIBED BELOW. SITE-WON NATURAL MATERIALS OR IMPORTED GRANULAR FILL MAY BE USED AS GENERAL FILL IN AREAS REQUIRING FILLING OR FOR REPLACEMENT OF REMOVED UNSUITABLE SUBGRADE MATERIAL.
 - THESE FILL MATERIALS SHALL BE COMPACTED IN LAYERS NOT GREATER THAN 300 mm LOOSE THICKNESS, DEPENDING ON THE COMPACTION CAPABILITIES.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING ALL EXCAVATION, FILLING AND BACKFILLING OPERATIONS FOR THE EQUIPMENT PADS AND BUILDING(S), SUBGRADE BENEATH BUILDINGS AND EQUIPMENT PADS, AND BACKFILL FOR FOUNDATIONS, SHALL BE COMPACTED TO A MINIMUM OF 95% OF MAXIMUM DRY DENSITY WITHIN A MOISTURE CONTENT RANGE OF +2% OF OPTIMUM MOISTURE AS DETERMINED BY AS 1289.5.1.1.
- TO IMPROVE PERFORMANCE OF PERIMETER AND INTERNAL ROADS, COMPACT THE SURFACE OF THE EXPOSED SUBGRADE TO AT LEAST 95% MODIFIED MAXIMUM DRY DENSITY AT MOISTURE CONTENT WITHIN -3% AND +1% OF STANDARD OPTIMUM MOISTURE CONTENT.
- FOR THE MAIN ACCESS ROAD AND MORE HEAVILY TRAFFICKED AREAS, THE SUBGRADE SHALL BE MOISTURE CONDITIONED AND COMPACTED TO 95% OF MODIFIED MAXIMUM DRY DENSITY, WITHIN -3% AND +1% OF STANDARD OPTIMUM MOISTURE CONTENT.
- IN THE EVENT OF WOVEN GEOTEXTILE FABRIC WILL BE USED FOR THE ROAD, IT SHALL BE BONTX SG30/30 OR CONTRACTOR APPROVED EQUAL.
- GRAVEL BASECOURSE FOR THE PERIMETER, INTERNAL, AND ACCESS ROADS SHALL BE COMPACTED IN MAXIMUM 200 THICK LOOSE LAYERS TO 95% OF MODIFIED MAXIMUM DRY DENSITY AT MOISTURE CONTENT WITHIN -2% AND +2% OF MODIFIED OPTIMUM MOISTURE CONTENT.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING ALL OPERATIONS IN CONNECTION WITH UNDERGROUND DC AND AC CABLING. (REFER TO ELECTRICAL DRAWINGS FOR TRENCHING DETAILS). BACKFILL SHALL BE COMPACTED TO A MINIMUM OF 90% OF MAXIMUM DRY DENSITY WITHIN A MOISTURE CONTENT RANGE OF +2% OF OPTIMUM MOISTURE AS DETERMINED BY AS 1289.5.1.1.
- EXCAVATION, PROCESSING, RE-COMPACTION AND COMPACTION CONTROL OF GENERAL FILL MATERIALS SHALL BE UNDERTAKEN IN ACCORDANCE WITH AS 3798-2007, "GUIDELINES ON EARTHWORKS FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS"
- STRUCTURAL FILL MAY CONSIST OF IMPORTED MATERIALS OR SOIL EXCAVATED FROM THE SITE. STRUCTURAL FILL FROM EITHER SOURCE SHALL BE USED ONLY IF THE MATERIAL MEETS INDICATED REQUIREMENTS.

STANDARDS:

- THE SITE IMPROVEMENTS SHOWN HAVE UTILIZED THE FOLLOWING STANDARDS AND SHALL BE CONSTRUCTED IN ACCORDANCE WITH:
 - LANDCOM BLUE BOOK - MANAGING URBAN STORMWATER, SOILS, AND CONSTRUCTION
 - AS 1725 - PERIMETER FENCE (APPENDIX K)
 - AS 4687 - TEMPORARY FENCING
 - AUSTROADS GUIDE TO ROAD DESIGN - PART 3: GEOMETRIC DESIGN
 - AUSTROADS GUIDE TO PAVEMENT TECHNOLOGY - PART 6: UNSEALED PAVEMENTS

KEY NOTE:

DISC AND ROLL METHODS WILL BE UTILIZED FOR THE ROADWAY, SIDEWALKS AND ALL OTHER DISTURBED AREAS THAT ARE REQUIRED TO BE ROLLED FLAT.

VEGETATION TO BE SLASHED ON ALL AREAS THAT DO NOT REQUIRE SPOT GRADING OR CUT/FILL.

SITE SHALL NOT BE GRADED IN ITS ENTIRETY. SPOT GRADES SHOWN ON SITE PLANS AND GRADING PLANS ARE TO PROVE THAT GRADING MEETS FIRST SOLAR CRITERIA AND TOLERANCES. SPOT GRADES WHERE EXISTING EQUALS PROPOSED DO NOT NEED TO BE GRADED OUT. DO NOT LOWER GRADE BELOW EXISTING SURFACE UNLESS NOTED OTHERWISE.

ABBREVIATIONS

CEMP	CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN
EE	EQUIPMENT ELEVATION (MINIMUM-MAY BE HIGHER IF REQUIRED BY ELECTRICAL OR STRUCTURAL PLANS)
FS	FIRST SOLAR
GE	GROUND ELEVATION
GP	GROUND PROPOSED
m	METRE
mm	MILLIMETRE
MDD	MAXIMUM DRY DENSITY
NIC	NOT IN CONTRACT
OMC	OPTIMUM MOISTURE CONTENT
PCS	POWER CONVERSION SKID
PV	PHOTOVOLTAIC
PVCS	PHOTOVOLTAIC COMBINING SWITCHGEAR
PVIS	PHOTOVOLTAIC INTERCONNECTION SWITCHGEAR
SWMP	SOIL AND WATER MANAGEMENT PLAN
TYP.	TYPICAL
UNO	UNLESS NOTED OTHERWISE

LEGEND

	EXISTING CONTOUR LINE
	PROPOSED CONTOUR LINE
	PROPERTY LINE
	SECURITY FENCE
	TEMPORARY / MOVE-ON FENCE
	GRAVELED-SURFACED AREA (HEAVY)
	GRAVEL-SURFACED AREA
	EXPOSED SUBGRADE TO BE SCARIFIED AND RECOMPACTED. FILL AS NECESSARY TO MATCH EXISTING GRADE. DO NOT LOWER GRADE BELOW EXISTING. (300MM LIFTS MAX)
	SIGN

LANGAN

4	20-06-2014	REVISED GRADING KEY NOTE	KMH	SP	RB
3	27-05-14	REVISED PER CPP LAYDOWN AND DUST POND VOLUME	RS	SP	RB
2	13-05-14	REVISED PER BECA COMMENTS AND CPP LAYDOWN	KMH	SP	RB
1	14-03-14	REVISED PER SURVEY AND 90% AGL/SKM MEETING	KMH	CE	RB
0	10-02-2014	ISSUED FOR CONSTRUCTION	KMH	CE	RB
REV	DATE	DESCRIPTION	BY	CHK	APP

THIS PRINT IS DESIGNED FOR ISO-A1, (841mm X 594mm) PLOTTING
 THIS PRINT IS NOT TO BE USED FOR CONSTRUCTION UNLESS NOTED AND SIGNED OK FOR CONSTRUCTION ABOVE LAST REVISION.

	FIRST SOLAR ELECTRIC LLC. 400 CROSSING BLVD, 5TH FLOOR BRIDGEWATER, NJ 08807 PHONE: (908) 809-4000 FAX: (908) 809-4020 WWW.FIRSTSOLAR.COM
--	--

	DEVELOPER: AGL PV SOLAR DEVELOPMENTS PTY LIMITED
--	---

TITLE: **BROKEN HILL SOLAR PARK
BROKEN HILL, NEW SOUTH WALES
AUSTRALIA**

PROJECT: **53.76 MWac SOLAR PHOTOVOLTAIC SYSTEM**

SHEET TITLE: **GENERAL NOTES, ABBREVIATIONS & LEGEND - CIVIL**

PROJ. MGR. LOUIS THIRO	PROJ. ENGR. PETER GREEN	DR. BY JIM GIOVAS	CHK. BY SITE CODE	DES. BY DRAWING No.	SCALE: REV.
FIRST SOLAR JOB No. SYS-00061	ABH1	C000	4		

DOCUMENT No. **BH-FS-CI-DWG-0000**

DIAL BEFORE YOU DIG
www.1100.com.au

THIS PUBLICATION CONTAINS VALUABLE PROPRIETARY AND CONFIDENTIAL INFORMATION OF FIRST SOLAR, INC. ("FIRST SOLAR") WHICH RETAINS ALL COPYRIGHT RIGHTS TO IT UNDER 17 U.S.C. SECTION 106 AND IS PROTECTED BY U.S. AND INTERNATIONAL LAW. ANY REPRODUCTION, PREPARATION OF DERIVATIVE WORKS, DISTRIBUTION, PUBLIC PERFORMANCE OR DISPLAY, DISCLOSURE, AND/OR USE OF ALL OR ANY PORTION OF THIS PUBLICATION IN ANY FORM OR MEDIUM WITHOUT SPECIFIC WRITTEN AUTHORIZATION FROM FIRST SOLAR IS STRICTLY PROHIBITED.

Appendix F – CEMP Environmental Management Schedules (forms, reports and registers)



Form P01 Weekly Inspection Checklist

This form is to be completed weekly or immediately following significant rainfall (>15mm rainfall event)

Section A – Audit Details

The items contained within this inspection are based on the Project Approval MP10_0202 (issued 27 March 2013) and all associated documentation

This inspection is based on visual observations and advice from the personnel guiding the site visit

Audit Number	Audit Date	Checklist completed by	In Attendance

Site Conditions	
Wind speed	
Wind direction	
Temperature	
Recent Rain Fall	
Other	

Further Comments

Signed: _____



Section B - Summary of Audit

Number of Items Audited	Number of notices of Non-Compliances	Number of Recommendations	Copy of Audit Supplied to

Section C – Non-Compliances and Recommendations

The table below provides a summary of the non-compliances and recommendations required as a result of this audit process.

Notices of non-compliance

Item (e.g. A1)	Non Conformance	Corrective Action Required	Responsibility	Expected Completion

Item	Action Required	First Identified (W/E)	Expected Completion (W/E)

Section D – Environmental Checklist

Ref A	Section A - General	Yes	No	N / A
A1	All work being confined to designated areas			
A2	Have weather events been observed and recorded where appropriate?			
A3	Are rehabilitation areas healthy			
Ref B	Project Management			
B1	Were there any incidents in the past week			
B2	Were any complaints received in the past week			
B3	Has any additional consultation been required during the past week			
B4	Have the required forms relating to complaints and incidents been completed			
Ref C	Waste			
B1	Site is litter free			
B2	Is appropriate fencing around work areas in place to trap litter and debris?			
B3	Is waste appropriately sorted to comply with EPA waste management hierarchy?			
Ref D	Traffic			
D1	Are external road clean and little evidence of construction traffic?			
Ref E	Dangerous Goods and Refuelling			
E1	Refuelling area designated and drip tray/oil separation pit installed			

E2 Area for storage of any dangerous goods identified and compliant with CEMP guidelines

Ref F	Section B – SWMP	Yes	No	N / A
F1	Are all work areas clearly marked and defined			
F2	Are all temporary and permanent drains operation effectively (i.e. not eroding, discharging to stable areas)			
F3	Are all sediment traps functioning			
F4	Do any sediment traps need cleaning			
F5	Are all sediment fences in a good state of repair			
F6	Are action undertaken after the last inspection adequate and effective			
F7	Are any additional sediment control measures required			
F8	Are all areas of soil disturbance will be suitably stabilised			
F9	Are stockpiles appropriately managed			

FORM P03 – Complaints Record

Date:	Time:
Complaint Number:	
Activity Occurring on Site (e.g. civil works):	

How Complaint Was Lodged:

Telephone:	Post:	Email:	Verbal:
Other:			

Complainant Details:

Name:			
Address			
Phone:		Email:	
Preferred Method of Contact:			

Nature of Complaint:

Cause of Complaint:

Corrective Action:

Assigned to:

Follow up Required

--	--

Close Off:

Date:

Signature:	
Position:	



FORM P05

Event Notification and Investigation Report

Issued By:

Date of Issue:

Personnel Notified (notify Site Construction Manager and Site Safety Manger)

Name	Job Title	Date/Time

Based on the type of event, additional information may be required. **GO TO** the appropriate Appendix and follow instructions.



FORM P05

Event Notification and Investigation Report

Issued By:

Date of Issue:

Detailed Events Sequence Immediately Before, During and After the Incident

Before

Date	Time	Event

During

Date	Time	Event

After

Date	Time	Event

--



FORM P05

Event Notification and Investigation Report

Issued By:

Date of Issue:

Event Photos

Provide photos of accident scene if applicable

Photo Date:

Time of Day:

Location:

Brief Description:

Photo Date:

Time of Day:

Location:

Brief Description:



FORM P05

Event Notification and Investigation Report

Issued By:

Date of Issue:

Direct Cause and Causal Factors:

Utilize Root Cause Analysis method in determining causal factors

Direct Cause:

-

Causal Factors:

1. Name factor here
 1. Description
2. Name factor here
 1. Description
3. Name factor here
 1. Description

Corrective Actions Plan – to prevent reoccurrence

Corrective Action To Be Taken (include Work Order Number if applicable):	Responsible Person	Completion Date	Date Completed

This investigation form is intended to ensure the employee is cared for properly, all steps are followed, causal factors are determined and actions are identified to prevent recurrence. When complete please return to the EHS Department.

Supervisor (Print/Sign):		Date:	
Site Manager (Print/Sign):		Date:	
Safety (Print/Sign):		Date:	



FORM P05

Event Notification and Investigation Report

Issued By:

Date of Issue:

Appendix A - Injury Information

IF Personal Injury, THEN complete next section.

Name of Injured Employee(s)	Job Title	Company Name	Nature of Injury	Activity being performed

Drug and Alcohol Screen (for incidents based on Class 1 & 2 or Class P1)

Did the employee complete a Drug and Alcohol Screen?

YES

NO

Date:

Note: Employee is not to return to work until a negative drug and alcohol result is received.

Exposure – How the event occurred		Source – Object, substance, person or exposure that directly produced the event or inflicted the injury	
Animal Exposure	Bodily Reaction	Animal	Chemical
Caught In	Contact with Skin	Container	Door
Electrical Contact	Environmental Exposure	Electrical AC	Electrical DC
Explosion	Fall	Food	Furniture
Fire	Inhalation	Insect	Knife
Insect Exposure	Noise Exposure	Ladder	Motor Vehicle
N/A	Object Struck Vehicle	N/A	Noise
Other	Overexertion	Other	Person
Oxygen Deficiency	Repetitive Motion/Ergo	Plant/Vegetation	Repetitive Motion
Struck Against	Struck By	Solar Panel	Tool – Hand
Temperature Extremes	Vehicle Struck Object	Tool – Power	Trencher
Vehicle Struck Vehicle		Walking Surface	Weather
Body Part – Identify the part of the body affected by the injury or illness		Nature of Injury – Identify the physical characteristics of injury or illness	
Ankle	Back	Abrasion/Scratch	Amputation
Buttock	Calf	Animal Bite	Arc Flash Burn
Chest	Ear	Blisters	Bruise/Contusion
Elbow	Eye	Chemical Burn	Cold-Related
Face	Finger	Crushing	Dermatitis
Foot	Forearm	Dislocation	Electrical Contact/Shock
Groin	Hand	Fracture	Heart Attack
Head	Hip	Heat-Related	Inflammation
Jaw	Knee	Insect Sting or Bite	Laceration
Leg	Mouth	N/A	Poisoning
Neck	N/A	Puncture	Splinter/Foreign Body
Nose	Shoulder	Sprain/Strain	Stroke
Stomach	Teeth	Thermal Burn	
Thigh	Toes		
Throat	Wrist		



FORM P05

Event Notification and Investigation Report

Issued By:

Date of Issue:

Appendix B - Vehicle/Equipment Damage Information

IF Vehicle or Equipment Damage, THEN complete next section.

Location of Accident		City		State		Zip Code	
Accident Details							
Driver's Name							
Vehicle/Equipment Information							
Year	Make	Model	Equipment/License Plate Number		Vehicle/Equipment Owned By?		

Drug and Alcohol Screen (for incidents involving vehicle accident)

Did the employee complete a Drug and Alcohol Screen?

YES

NO

Date:

Note: Employee is not to return to work until a negative drug and alcohol result is received.

Sketch the Accident Scene – Provide an illustration showing location of damaged vehicle/equipment in relation to surroundings.



FORM P05

Event Notification and Investigation Report

Issued By:

Date of Issue:

Appendix C – Near Miss / Deficient Condition Information

IF Near Miss or Deficient Condition, THEN complete next section.

Risk Assessment Matrix (Circle the appropriate letter in the matrix below)

Guide to Risk Score	1. How severely could it hurt someone or how ill could it make someone?	2. How likely is it to be that bad?			
		Very likely Could happen at any time	Likely Could happen sometime	Unlikely Could happen, but very rarely	Very unlikely Could happen, but probably never will
H Urgent/High Priority – act now	Kill or cause permanent or ill health	H	H	H	M
M Medium Priority – action required this week		H	H	M	M/L
M/L Low to Medium Priority – Hazard may not need immediate action		H	M	M/L	L
L Low priority if hazard increases risk action is required		M	M/L	L	L

What are the risks and potential consequences of the Near Miss or Deficient Condition Identified?

•



FORM P05

Event Notification and Investigation Report

Issued By:

Date of Issue:

Personnel Statement

Employee's Name:

Project:

Supervisor:

Incident Location:

Incident Date:

Craft Classification:

Incident Time:

Task at time of Incident:

Length of Time on Project: 1 month / 3 months / 6 months / 9 months / 1 year

Description of Incident:

Name:

Signature:

Date:

Witness:

Signature:

Date:

FORM-P08: Environmental Compliance Training Register

Date	Name	Organisation	Training Topic	Signed I confirm that I have received training

Photocopy form as required.

Appendix G – Agency Consultation



Shelley Anderson

From: Allan Murphy <amurphy@geolyse.com>
Sent: Friday, 4 April 2014 3:33 PM
To: Jeff McAuliffe
Cc: Aaron Schimann
Subject: FW: 214078_SOLAR POWER STATION PIPELINE

Follow Up Flag: Follow up
Flag Status: Flagged

Jeff
Please find below the latest correspondence from Broken Hill Council in relation to the requirements for an assessment for Aboriginal artifacts.
It appears that a basic inspection of the areas to be excavated (ie the road and water course crossings) will be required to meet their requirements. Presumably in order to be robust should there be an issue, this would be best done by someone qualified in this area.

Regards

Allan Murphy
Project Manager – Environment & Engineering
Geolyse Pty Ltd
1st Floor, 62 Wingewarra Street
PO Box 1842
Dubbo NSW 2830
Ph: 02 6884 1525
Fx: 02 6884 1470
Mob: 0418 867989
Email: amurphy@geolyse.com
Web: www.geolyse.com

.....
IMPORTANT

This e-mail and any attachments may contain material which is proprietary, privileged, confidential and exempt from disclosure under applicable law. This e-mail, together with any attachments, is for the exclusive and confidential use of the addressee(s). Any other distribution, use of, or reproduction without prior written consent is strictly prohibited. If received in error, please delete all copies and advise the sender immediately. Geolyse Pty Ltd does not warrant or guarantee this message to be free of errors, interference or viruses.

From: Gillespie, Patrick [mailto:Patrick.Gillespie@brokenhill.nsw.gov.au]
Sent: Friday, 4 April 2014 3:50 PM
To: 'Allan Murphy'
Subject: RE: 214078_SOLAR POWER STATION PIPELINE

Allan,

Your contactors will only need to check where excavation work is going to be done. Any artefacts will be readily identifiable and as you state it will be unlikely that any will be found at the track & creek crossings. We still need the areas to be checked as a matter of protocol so as to comply with our conditions. If any are found we need to be notified.

Cheers,

Pat

Patrick Gillespie
Land Officer, Broken Hill City Council
240 Blende Street Broken Hill NSW 2880 Australia
P. (08) 8080 3352
W. www.brokenhill.nsw.gov.au
E. Patrick.Gillespie@brokenhill.nsw.gov.au



DISCLAIMER

This e-mail message and any accompanying attachments may contain information that is confidential and subject to legal privilege. If you are not the intended recipient do not read, use, disseminate, distribute or copy this message or attachments.

If you have received this message in error, please notify the sender immediately and delete this message. Views expressed in this e-mail are those of the individual, except where specifically stated otherwise.

Broken Hill City Council does not warrant this message to be free of errors, interference or viruses.

From: Allan Murphy [<mailto:amurphy@geolyse.com>]
Sent: Friday, 4 April 2014 3:10 PM
To: Gillespie, Patrick
Subject: RE: 214078_SOLAR POWER STATION PIPELINE

Pat
Thanks for sending the "Standard Conditions" that apply to work on the common.
As you indicated they are aimed mainly at mining exploration, however are still a reasonable fit to the proposed work.

In relation to the need for an aboriginal artifact assessment, as the only planned excavation is across roads/ tracks and water courses (ie highly disturbed or modified areas), would it be sufficient for the contractor conducting the works to be inducted / briefed on this requirement and the need to cease work, and report any observation or disturbance of such artifacts should it occur? **Or** would an assessment of the proposed full route, or just in the proximity of the crossings, prior to the works be required as well?

Regards

Allan Murphy
Project Manager – Environment & Engineering
Geolyse Pty Ltd
1st Floor, 62 Wingewarra Street
PO Box 1842
Dubbo NSW 2830
Ph: 02 6884 1525
Fx: 02 6884 1470
Mob: 0418 867989
Email: amurphy@geolyse.com
Web: www.geolyse.com

.....
IMPORTANT

This e-mail and any attachments may contain material which is proprietary, privileged, confidential and exempt from disclosure under applicable law. This e-mail, together with any attachments, is for the exclusive and confidential use of the addressee(s). Any other distribution, use of, or reproduction without prior written consent is strictly prohibited. If received in error, please delete all copies and advise the sender immediately. Geolyse Pty Ltd does not warrant or guarantee this message to be free of errors, interference or viruses.

From: Gillespie, Patrick [<mailto:Patrick.Gillespie@brokenhill.nsw.gov.au>]
Sent: Friday, 4 April 2014 1:39 PM
To: 'Allan Murphy'
Subject: FW: 214078_SOLAR POWER STATION PIPELINE

Hi Allan,

Please find attached Councils requirements as they relate to Mineral Exploration within the Common. Whilst not totally relevant to your project they are indicative of our general requirements for any works done within the Common.

I trust they are of assistance.

In relation to the watercourse crossings your proposed actions are acceptable.

Cheers,

Pat

Patrick Gillespie
Land Officer, Broken Hill City Council
240 Blende Street Broken Hill NSW 2880 Australia
P. (08) 8080 3352
W. www.brokenhill.nsw.gov.au
E. Patrick.Gillespie@brokenhill.nsw.gov.au



DISCLAIMER

This e-mail message and any accompanying attachments may contain information that is confidential and subject to legal privilege. If you are not the intended recipient do not read, use, disseminate, distribute or copy this message or attachments.

If you have received this message in error, please notify the sender immediately and delete this message. Views expressed in this e-mail are those of the individual, except where specifically stated otherwise.

Broken Hill City Council does not warrant this message to be free of errors, interference or viruses.

From: Oldsen Peter
Sent: Friday, 28 March 2014 4:17 PM
To: Gillespie, Patrick
Subject: FW: 214078_SOLAR POWER STATION PIPELINE

Hi Pat,

Can you respond with the standard conditions so that they can come back to us with a project scope.
Thanks for your help.

Peter Oldsen
Group Manager Sustainability, Broken Hill City Council
240 Blende Street Broken Hill NSW 2880 Australia
P. (08) 8080 3341
M. 0418 808 093

W. www.brokenhill.nsw.gov.au
E. Peter.Oldsen@brokenhill.nsw.gov.au



DISCLAIMER

This e-mail message and any accompanying attachments may contain information that is confidential and subject to legal privilege. If you are not the intended recipient do not read, use, disseminate, distribute or copy this message or attachments.

If you have received this message in error, please notify the sender immediately and delete this message. Views expressed in this e-mail are those of the individual, except where specifically stated otherwise.

Broken Hill City Council does not warrant this message to be free of errors, interference or viruses.

From: Allan Murphy [<mailto:amurphy@geolyse.com>]
Sent: Friday, 28 March 2014 4:02 PM
To: Oldsen Peter
Cc: 'Orange Document Control'; 'Allan Murphy'
Subject: 214078_SOLAR POWER STATION PIPELINE

Peter

Sorry if you seem to be getting bombarded from all sides on this one!

I know you have been communicating with Doug Landfear (AGL), on this (I have copies of your two way correspondence). First Solar have asked me to contact you with the aim of working toward formalizing the discussions to date.

You mention that letters between the parties would be all that would be required, along with proof of adequate insurances etc.

If OK by you we planned to draft up a letter summarizing the pipeline requirements (as understood from both parties), include a basic map, and attach the COCs of insurances. So we can address the standard conditions / requirements by Council relating to safety, re-instatement, signage etc (as mentioned in your correspondence to Doug), if you had something prepared on this, could you please send it to me.

I also did have one question relating to watercourse crossings. When we last spoke you mentioned that you would require some attention to areas where the pipeline crossed water courses, community safety and erosion reasons. We had in mind that the pipeline would be placed under the bed of the watercourse, be back filled, and then a strip of Geo-fabric (say about 2 m wide, with the upstream edge buried) and then some rock (say 100mm)placed over. Is this an over kill, or is it what you had in mind?

Regards

Allan Murphy
Project Manager – Environment & Engineering
Geolyse Pty Ltd
1st Floor, 62 Wingewarra Street
PO Box 1842
Dubbo NSW 2830
Ph: 02 6884 1525
Fx: 02 6884 1470
Mob: 0418 867989
Email: amurphy@geolyse.com
Web: www.geolyse.com

.....
IMPORTANT

This e-mail and any attachments may contain material which is proprietary, privileged, confidential and exempt from disclosure under applicable law. This e-mail, together with any attachments, is for the exclusive and confidential use of the addressee(s). Any other distribution, use of, or

Shelley Anderson

From: Allan Murphy <amurphy@geolyse.com>
Sent: Friday, 4 April 2014 3:33 PM
To: Jeff McAuliffe
Cc: Aaron Schimann
Subject: FW: 214078_SOLAR POWER STATION PIPELINE

Follow Up Flag: Follow up
Flag Status: Flagged

Jeff
Please find below the latest correspondence from Broken Hill Council in relation to the requirements for an assessment for Aboriginal artifacts.
It appears that a basic inspection of the areas to be excavated (ie the road and water course crossings) will be required to meet their requirements. Presumably in order to be robust should there be an issue, this would be best done by someone qualified in this area.

Regards

Allan Murphy
Project Manager – Environment & Engineering
Geolyse Pty Ltd
1st Floor, 62 Wingewarra Street
PO Box 1842
Dubbo NSW 2830
Ph: 02 6884 1525
Fx: 02 6884 1470
Mob: 0418 867989
Email: amurphy@geolyse.com
Web: www.geolyse.com

.....
IMPORTANT

This e-mail and any attachments may contain material which is proprietary, privileged, confidential and exempt from disclosure under applicable law. This e-mail, together with any attachments, is for the exclusive and confidential use of the addressee(s). Any other distribution, use of, or reproduction without prior written consent is strictly prohibited. If received in error, please delete all copies and advise the sender immediately. Geolyse Pty Ltd does not warrant or guarantee this message to be free of errors, interference or viruses.

From: Gillespie, Patrick [mailto:Patrick.Gillespie@brokenhill.nsw.gov.au]
Sent: Friday, 4 April 2014 3:50 PM
To: 'Allan Murphy'
Subject: RE: 214078_SOLAR POWER STATION PIPELINE

Allan,

Your contactors will only need to check where excavation work is going to be done. Any artefacts will be readily identifiable and as you state it will be unlikely that any will be found at the track & creek crossings. We still need the areas to be checked as a matter of protocol so as to comply with our conditions. If any are found we need to be notified.

Cheers,

Pat

Patrick Gillespie
Land Officer, Broken Hill City Council
240 Blende Street Broken Hill NSW 2880 Australia
P. (08) 8080 3352
W. www.brokenhill.nsw.gov.au
E. Patrick.Gillespie@brokenhill.nsw.gov.au



DISCLAIMER

This e-mail message and any accompanying attachments may contain information that is confidential and subject to legal privilege. If you are not the intended recipient do not read, use, disseminate, distribute or copy this message or attachments.

If you have received this message in error, please notify the sender immediately and delete this message. Views expressed in this e-mail are those of the individual, except where specifically stated otherwise.

Broken Hill City Council does not warrant this message to be free of errors, interference or viruses.

From: Allan Murphy [<mailto:amurphy@geolyse.com>]
Sent: Friday, 4 April 2014 3:10 PM
To: Gillespie, Patrick
Subject: RE: 214078_SOLAR POWER STATION PIPELINE

Pat
Thanks for sending the "Standard Conditions" that apply to work on the common.
As you indicated they are aimed mainly at mining exploration, however are still a reasonable fit to the proposed work.

In relation to the need for an aboriginal artifact assessment, as the only planned excavation is across roads/ tracks and water courses (ie highly disturbed or modified areas), would it be sufficient for the contractor conducting the works to be inducted / briefed on this requirement and the need to cease work, and report any observation or disturbance of such artifacts should it occur? **Or** would an assessment of the proposed full route, or just in the proximity of the crossings, prior to the works be required as well?

Regards

Allan Murphy
Project Manager – Environment & Engineering
Geolyse Pty Ltd
1st Floor, 62 Wingewarra Street
PO Box 1842
Dubbo NSW 2830
Ph: 02 6884 1525
Fx: 02 6884 1470
Mob: 0418 867989
Email: amurphy@geolyse.com
Web: www.geolyse.com

.....
IMPORTANT

This e-mail and any attachments may contain material which is proprietary, privileged, confidential and exempt from disclosure under applicable law. This e-mail, together with any attachments, is for the exclusive and confidential use of the addressee(s). Any other distribution, use of, or reproduction without prior written consent is strictly prohibited. If received in error, please delete all copies and advise the sender immediately. Geolyse Pty Ltd does not warrant or guarantee this message to be free of errors, interference or viruses.

From: Gillespie, Patrick [<mailto:Patrick.Gillespie@brokenhill.nsw.gov.au>]
Sent: Friday, 4 April 2014 1:39 PM
To: 'Allan Murphy'
Subject: FW: 214078_SOLAR POWER STATION PIPELINE

Hi Allan,

Please find attached Councils requirements as they relate to Mineral Exploration within the Common. Whilst not totally relevant to your project they are indicative of our general requirements for any works done within the Common.

I trust they are of assistance.

In relation to the watercourse crossings your proposed actions are acceptable.

Cheers,

Pat

Patrick Gillespie
Land Officer, Broken Hill City Council
240 Blende Street Broken Hill NSW 2880 Australia
P. (08) 8080 3352
W. www.brokenhill.nsw.gov.au
E. Patrick.Gillespie@brokenhill.nsw.gov.au



DISCLAIMER

This e-mail message and any accompanying attachments may contain information that is confidential and subject to legal privilege. If you are not the intended recipient do not read, use, disseminate, distribute or copy this message or attachments.

If you have received this message in error, please notify the sender immediately and delete this message. Views expressed in this e-mail are those of the individual, except where specifically stated otherwise.

Broken Hill City Council does not warrant this message to be free of errors, interference or viruses.

From: Oldsen Peter
Sent: Friday, 28 March 2014 4:17 PM
To: Gillespie, Patrick
Subject: FW: 214078_SOLAR POWER STATION PIPELINE

Hi Pat,

Can you respond with the standard conditions so that they can come back to us with a project scope.
Thanks for your help.

Peter Oldsen
Group Manager Sustainability, Broken Hill City Council
240 Blende Street Broken Hill NSW 2880 Australia
P. (08) 8080 3341
M. 0418 808 093

W. www.brokenhill.nsw.gov.au
E. Peter.Oldsen@brokenhill.nsw.gov.au



DISCLAIMER

This e-mail message and any accompanying attachments may contain information that is confidential and subject to legal privilege. If you are not the intended recipient do not read, use, disseminate, distribute or copy this message or attachments.

If you have received this message in error, please notify the sender immediately and delete this message. Views expressed in this e-mail are those of the individual, except where specifically stated otherwise.

Broken Hill City Council does not warrant this message to be free of errors, interference or viruses.

From: Allan Murphy [<mailto:amurphy@geolyse.com>]
Sent: Friday, 28 March 2014 4:02 PM
To: Oldsen Peter
Cc: 'Orange Document Control'; 'Allan Murphy'
Subject: 214078_SOLAR POWER STATION PIPELINE

Peter

Sorry if you seem to be getting bombarded from all sides on this one!

I know you have been communicating with Doug Landfear (AGL), on this (I have copies of your two way correspondence). First Solar have asked me to contact you with the aim of working toward formalizing the discussions to date.

You mention that letters between the parties would be all that would be required, along with proof of adequate insurances etc.

If OK by you we planned to draft up a letter summarizing the pipeline requirements (as understood from both parties), include a basic map, and attach the COCs of insurances. So we can address the standard conditions / requirements by Council relating to safety, re-instatement, signage etc (as mentioned in your correspondence to Doug), if you had something prepared on this, could you please send it to me.

I also did have one question relating to watercourse crossings. When we last spoke you mentioned that you would require some attention to areas where the pipeline crossed water courses, community safety and erosion reasons. We had in mind that the pipeline would be placed under the bed of the watercourse, be back filled, and then a strip of Geo-fabric (say about 2 m wide, with the upstream edge buried) and then some rock (say 100mm)placed over. Is this an over kill, or is it what you had in mind?

Regards

Allan Murphy
Project Manager – Environment & Engineering
Geolyse Pty Ltd
1st Floor, 62 Wingewarra Street
PO Box 1842
Dubbo NSW 2830
Ph: 02 6884 1525
Fx: 02 6884 1470
Mob: 0418 867989
Email: amurphy@geolyse.com
Web: www.geolyse.com

.....
IMPORTANT

This e-mail and any attachments may contain material which is proprietary, privileged, confidential and exempt from disclosure under applicable law. This e-mail, together with any attachments, is for the exclusive and confidential use of the addressee(s). Any other distribution, use of, or

From: Matthew Gibson <MGibson@biosis.com.au>
Sent: Tuesday, 20 May 2014 3:34 PM
To: Shelley Anderson
Subject: FW: Broken Hill Solar Plant - Construction FLora and Fauna Management Plan

From: Peter Ewin [<mailto:Peter.Ewin@environment.nsw.gov.au>]
Sent: Tuesday, 20 May 2014 3:17 PM
To: Matthew Gibson
Cc: Michael Todd
Subject: RE: Broken Hill Solar Plant - Construction FLora and Fauna Management Plan

Matthew,

OEH has reviewed the Construction Environmental Management Plan (CEMP) - Sub-plan A- Flora and Fauna Management Plan and is satisfied that it meets the conditions of the Broken Hill Solar PV Power Station Project Approval (Application No.: MP10_0202).

At this stage, OEH has no further comment to make in regards to this development.

At this stage OEH has not contacted the Department of Planning and Environment to confirm this outcome – if you require this please let me know a contact and I will pass on this e-mail.

If you would like to discuss this response further please contact Mick Todd directly on 03 5021 8915.

Thanks,
Peter

Peter Ewin

Team Leader Planning, South West
Regional Operations Group (South Branch)
Office of Environment and Heritage
Ph: 02 6022 0606
Fax: 02 6022 0610
Mob: 0427 433 937

From: Matthew Gibson [<mailto:MGibson@biosis.com.au>]
Sent: Friday, 16 May 2014 9:33 AM
To: Ewin Peter
Cc: 'mcwenvironmental@bigpond.com'; 'Jeff.McAuliffe@FIRSTSOLAR.COM'; 'Shelley.anderson@beca.com'
Subject: Broken Hill Solar Plant - Construction FLora and Fauna Management Plan

Hi Peter,

Please find attached the Flora and Fauna Management Plan Section of the Construction Environmental Management Plan for the Broken Hill Solar Plant. We have also attached a separate figure specifying the extent of vegetation clearance. This will be the basis of the figure included in the final plan.

Could you please arrange for this to be reviewed by the appropriate person by 22nd May, as we must have the endorsed plan completed by the end of the month.

Please give me a call if you would like to discuss,

Regards,

Matt

Matthew Gibson
Ballarat Resource Group Manager
Mobile: 0418 522 401
Email: mgibson@biosis.com.au



Leaders in Ecology and Heritage Consulting

506 Macarthur Street (PO Box 18N) Ballarat VIC 3350

ph: (03) 5331 7000 fax: (03) 5331 7033

www.biosis.com.au

The information transmitted including attachments is intended only for the person or entity to which it is addressed and may contain copyright material, or information that is confidential or is exempt from disclosure by law. Any review, retransmission, dissemination or other use of, or taking of any action in reliance upon this information by persons or entities other than the intended recipient is strictly prohibited. If you received this in error, please contact the sender and delete the material from your computer. The views expressed in this email are those of the sender except where the sender expressly and with authority states them to be the views of Biosis Pty Ltd. Biosis Pty Ltd does not represent that this email is free of errors, viruses or interference. When using email to communicate with Biosis Pty Ltd, access to that information by Biosis Pty Ltd personnel is strictly limited and controlled.

This email is intended for the addressee(s) named and may contain confidential and/or privileged information.

If you are not the intended recipient, please notify the sender and then delete it immediately.

Any views expressed in this email are those of the individual sender except where the sender expressly and with authority states them to be the views of the Office of Environment and Heritage, NSW Department of Premier and Cabinet.

PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS EMAIL

From: Andrew Bell <andrew.bell@crowmland.nsw.gov.au>
Sent: Thursday, 29 May 2014 12:28 PM
To: Shelley Anderson
Cc: Shaun Barker
Subject: RE: 2584379 Broken Hill Solar PV Power Station - Ground Cover Management Plan

Hi Shelly,

The consultant you have engaged appears to have adequate experience in the required field and we do not require a copy of the Plan prior to submission to Planning. In my view, this would be interference with the Planning process. If NSW Planning seeks our advice on the adequacy of the Plan prior to making a determination, we will provide that advice at that time.

Regards

Andrew Bell | Senior Area Manager Far West and Western Lands Commissioner
NSW Trade & Investment, Crown Lands
45 Wingewarra St | Dubbo NSW 2830
PO Box 2185 | Dangar NSW 2309
T: 02 6883 5401 | M: 0409 100 587 | E: andrew.bell@crowmland.nsw.gov.au
W: www.crowmland.nsw.gov.au

From: Shelley Anderson [mailto:shelley.anderson@beca.com]
Sent: Tuesday, 27 May 2014 4:51 PM
To: 'andrew.bell@lands.nsw.gov.au'
Subject: 2584379 Broken Hill Solar PV Power Station - Ground Cover Management Plan

Good afternoon Andrew

My name is Shelley Anderson from Beca. We are currently finalising the CEMP for the Broken Hill Solar PV Power Station, on behalf of First Solar.

I understand you spoke to Steve Mason from our office earlier this year? (our notes indicate mid-January – contact details Andrew Bell , ph: 02 68835401).

Steve contacted you to discuss the use of agronomist to prepare the ground cover management sub-plan. Our understanding from this conversation was that other suitably qualified professionals that were familiar with local conditions would be appropriate for consultation during plan development.

For your information, the details and qualifications of the person we have consulted with are provided at the end of this email. We are seeking to finalise the plan this week but have realised that you may need to review prior to submission to the Department of Planning and Infrastructure.

Could you please advise on the following:

- Whether you have any concerns about Matt's suitability for input to the ground cover management plan
- Whether you need to review the plan prior to submission Planning and Infrastructure
- Whether this review could be returned by end of Thursday?

Thanks a lot for your time,
Shelley Anderson

Matt Gibson

Senior Botanist Biosis Pty Ltd

Matthew has a broad knowledge and understanding of environmental issues and conservation management, as well as being familiar with the rangelands of western NSW . Matthew has excellent plant identification skills across a wide range of environments, as well as undertaking monitoring, habitat hectare assessments, condition assessment, mapping, analysis of biodiversity data and targeted searching for rare and threatened species. He also has extensive experience as a Consultant in natural resource management projects involving stakeholder consultation and interactions between managing authorities. Matt has a detailed understanding of biodiversity legislation and in Victoria, is a DSE Certified Habitat Hectares Assessor.

Matt's particular experience within western NSW includes-

- Vegetation survey and condition monitoring of 100 sites over three years on a range of land tenures in what was formerly the Lower Murray Darling catchment. Application of vegetation condition methods including Landscape Function Analysis (2006-2010 for the Lower Murray Darling Catchment Management Authority)
- Flora survey and vegetation mapping of conservation reserves in western New South Wales. Surveys conducted at Gundabooka National Park, Peery National Park, Mungo National Park, Tarawi Nature Reserve, Paroo-Darling National Park and Kinchega National Park (1993 - 2008 for the New South Wales Parks and Wildlife Service)
- Flora and fauna surveys of rangeland grazing stations within western NSW, including Nanya, Nagaela, Loch Lily, Ennisvale and Tararra.
- Vegetation mapping using satellite image analysis of south-west NSW and NW Victoria for SunRise 21 and RMAP.
- Flora and fauna surveys and vegetation mapping for the Murray-Darling Water Management Action Plan, Natural Resources Study.

Shelley Anderson

Associate - Environmental Scientist

Beca

Phone +61 7 3117 6300 Fax +61 7 3117 6311

Mobile +61 428 138 491

shelley.anderson@beca.com

www.beca.com

NOTICE: This email, if it relates to a specific contract, is sent on behalf of the Beca company which entered into the contract. Please contact the sender if you are unsure of the contracting Beca company or visit our web page <http://www.beca.com> for further information on the Beca Group. If this email relates to a specific contract, by responding you agree that, regardless of its terms, this email and the response by you will be a valid communication for the purposes of that contract, and may bind the parties accordingly.

This e-mail together with any attachments is confidential, may be subject to legal privilege and may contain proprietary information, including information protected by copyright. If you are not the intended recipient, please do not copy, use or disclose this e-mail; please notify us immediately by return e-mail and then delete this e-mail.

This message is intended for the addressee named and may contain confidential information. If you are not the intended recipient, please delete it and notify the sender. Views expressed in this message are those of the individual sender, and are not necessarily the views of their organisation.

From: Tim Baker <Tim.Baker@water.nsw.gov.au>
Sent: Tuesday, 27 May 2014 9:57 AM
To: Shelley Anderson
Subject: NOW Response - Broken Hill Solar SWMP
Attachments: ER21328_BrokenHillSWMP.pdf

Hi Shelley,

To confirm NOW's previous email comments regarding the construction SWMP of the Broken Hill Solar site please see response attached.

If you have any queries please let me know.

Regards
Tim

Tim Baker | Senior Water Regulation Officer
Department of Primary Industries | Office of Water
209 Cobra St | P O Box 717
Dubbo NSW 2830
T: 02 6841 7403 M: 0428162097 F: 02 6884 0096
E: Tim.Baker@water.nsw.gov.au
W: www.water.nsw.gov.au



Shelley Anderson
Beca
PO Box 55
FORTITUDE VALLEY QLD 4006

Contact Tim Baker
Phone 02 6841 7403
Mobile 0428 162 097
Fax 02 6884 0096
Email Tim.Baker@water.nsw.gov.au
Our ref ER21328

Dear Shelley

BROKEN HILL SOLAR PROJECT – SOIL AND WATER MANAGEMENT PLAN

I refer to your email dated 19th May 2014 requesting comments from the NSW Office of Water in relation to the draft Soil and Water Management Plan (SWMP) for the Broken Hill Solar Project. It is recognised this request is in accordance with Schedule 2, Part C, Condition C2 of Project Approval MP10_0202.

The NSW Office of Water has reviewed the document and provided preliminary comments via email on 21 and 22 May 2014. These comments were clarifying sediment and erosion control measures and included the following:

- Clarification is requested of the proposed sediment and erosion control and rehabilitation measures within the proposed drainage trenches and whether there is a requirement for check dams and/or sediment basins.
- Clarification is requested of the proposed sediment and erosion control measures on the downstream side of each proposed culvert. Drawing ABH1-C346 indicates rock rip rap on the bank to 0.4m however there is no indication of measures proposed on the bed of the drainage line. The Guidelines for Controlled Activities on Waterfront land recommend the use of a scour apron on the bed of the drainage line to mitigate bed erosion and to dissipate flow velocity.

Should you have any further queries in relation to this submission please do not hesitate to contact Tim Baker on (02) 6841 7403.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Mitchell Isaacs'.

Mitchell Isaacs
Manager Strategic Stakeholder Liaison
27 May 2014

David Hudson

From: Tim Baker <Tim.Baker@water.nsw.gov.au>
Sent: Thursday, September 25, 2014 9:24 AM
To: Turlough Guerin
Cc: mhaege@geolyse.com
Subject: Re: Broken Hill Solar Project Soil & Water Management Plan - CEMP Approval - Response to NSW Office of Water Comments

Dear Turlough,

The NSW Office of Water has reviewed your response dated 19 September 2014 and based on the drainage trenches being in accordance with the Bluebook guidelines and that the scour apron on the downstream side of culverts is to cover the bed and banks for a distance of 16m no further comment is required.

If you need to discuss further please give me a call.

Regards
Tim

Tim Baker | Senior Water Regulation Officer
Department of Primary Industries | Office of Water
209 Cobra St | P O Box 717
Dubbo NSW 2830
T: 02 6841 7403 M: 0428162097 F: 02 6884 0096
E: Tim.Baker@water.nsw.gov.au
W: www.water.nsw.gov.au

>>> Turlough Guerin <Turlough.Guerin@FIRSTSOLAR.COM> 19/09/2014 11:29 am >>>
Mr Tim Baker, Senior Water Regulation Officer
Department of Primary Industries, Office of Water
209 Cobra St, P O Box 717
Dubbo NSW 2830
Tim.Baker@water.nsw.gov.au

Dear Tim,

Please find attached First Solar's response to the clarifications you raised in your letter correspondence (ER 21328) in relation to First Solar's proposed Soil and Water Management Plan for the Broken Hill Solar Project. First Solar have now addressed these clarifications in the CEMP and explain how we have done this in the attached letter.

We are now ready to submit the final and revised version of the Broken Hill CEMP to the DP&I today and request your response to this email so that we can make this submission.

Your immediate assistance and response in this matter would be greatly appreciated.

Kind regards,

Turlough



Department of Primary Industries, Office of Water
Mr Tim Baker, Senior Water Regulation Officer
209 Cobra St, P O Box 717
Dubbo NSW 2830

September 19, 2014

Dear Tim

RE: BROKEN HILL SOLAR PROJECT – SOIL AND WATER MANAGEMENT PLAN AMENDMENTS

Further to previous correspondence dated 27 May 2014 (your ref ER21328), we are pleased to be able to respond to said queries namely:

1. “Whether there is a requirement for check dams and/or sediment basins”

We advise as per correspondence Baker-Andersen¹ that “on the basis the use of check dams is in accordance with the Landcom (2004) (Blue Book) Guidelines, there is no need for actual sed(iment) dams (ponds) to manage flow, NOW would be supportive”. On this basis First Solar will not include sediment dams in its CEMP.

2. “Use of scour apron on the bed of the drainage line to mitigate bed erosion and to dissipate flow velocity”

The approach therefore was to incorporate the use of a scour apron on the bed of the drainage line to mitigate bed erosion and to dissipate flow velocity in the soil and water management plan (Section 10 of the CEMP).

We have further expanded on section 10.6.3 of the CEMP (Soil and Water Management Plan) to ensure that each channel extends 16m beyond the culvert as a standard measure from “Controlled Activities on Waterfront Land” (NSW Office of Water, July 2012) and also to provide a suitable adequate energy dissipation measure in addition to providing additional bed stability.

¹ Email Tim Baker (NSW Office of Water) – Shelley Andersen (Beca), 22 May 2014



An example of the channel arrangement including road culvert and requirements for energy dissipation is provided below (and also Drawing ABH1-C346 Appendix E). The soil and water management details are shown in Drawing ABH1-C811.

The drainage channels will be lined with rock in entirety as per Landcom (2004) (Blue Book) Guidelines to cover the channel banks and bed and reduce the erosive energy of flow.

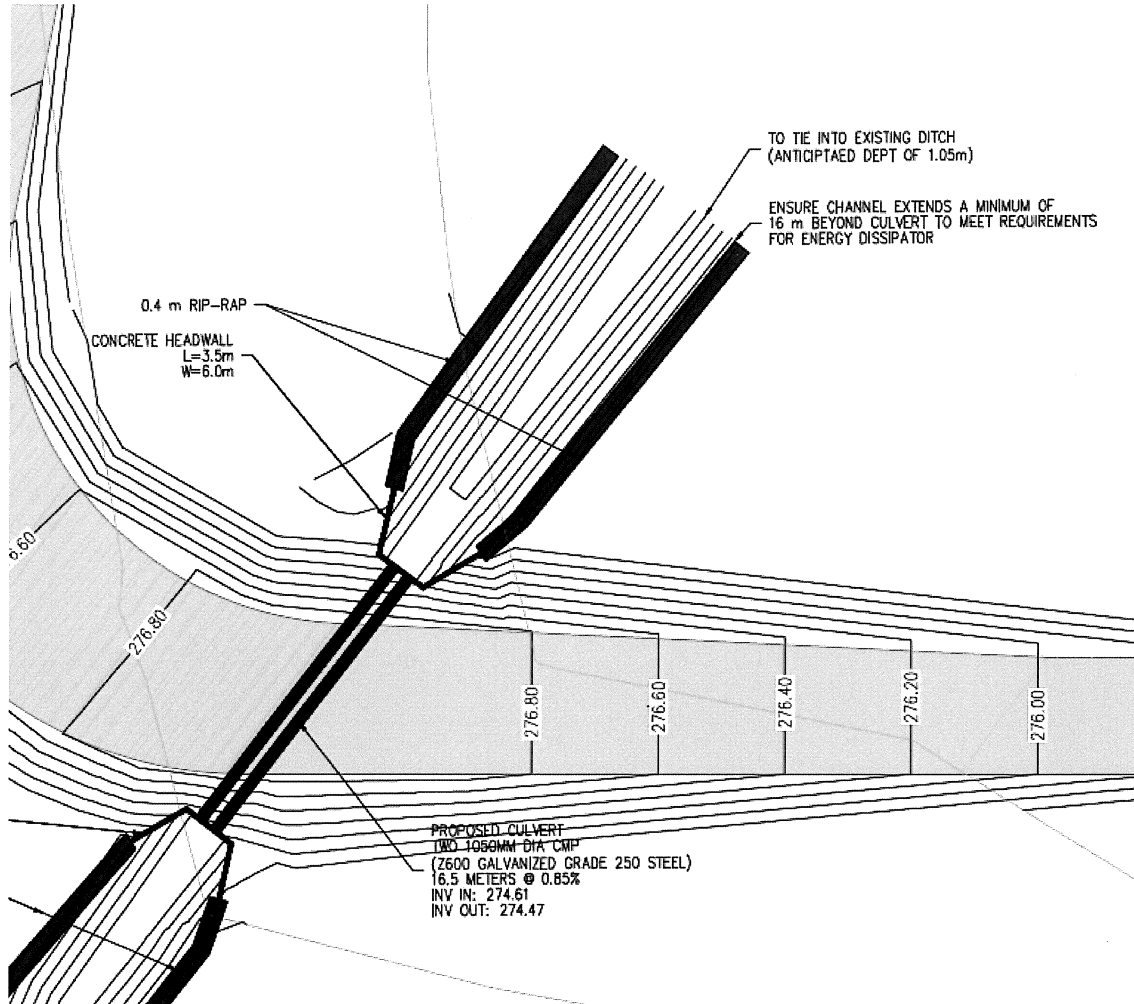
First Solar trust that this response is acceptable to the NSW Office of Water for approval of the project CEMP.

Yours sincerely

A handwritten signature in black ink, appearing to read "Jeff McAuliffe", written over a faint, illegible background.

Jeff McAuliffe

Project Manager



Shelley Anderson

From: MCINTYRE Andrew R <Andrew.MCINTYRE@rms.nsw.gov.au>
Sent: Thursday, 8 May 2014 9:03 PM
To: Adam Mackett
Cc: Development Western; SULICICH Joe
Subject: AGL SOL - Broken Hill Solar Plant - First Solar Traffic Management Plan (TMP) - Draft (RMS Comments)

Adam

Thanks for your return call and sorry we keep missing each other.

The draft TMP has been reviewed by RMS and the following comments are made:

- Page 5 of the document states that a second CEMP will be prepared and submitted at a later date for grid connection traffic generation/management. Will this work overlap with construction works and regardless of whether it does or does not, is this traffic generation likely to require further intersection improvements? Why can't the entire traffic generation (ie construction, grid connection, etc) all be included in the one TMP?
- Page 7 of the document states consultation with RMS has not yet occurred (as required by the consent) to determine haulage routes. The draft TMP provides haulage routes from Melbourne, Newcastle and Adelaide to the site. Is this considered to be the consultation? How firm are these routes?
- Page 12 provides highway traffic volumes in and around Broken Hill. These numbers seem very low. For example, at a location on the Barrier Highway west of Broken Hill and west of the subject land, RMS estimate (based on historical counts) is an AADT of 1264 vehicles compared to AADT 466 provided in the draft TMP. Where was this figure obtained from? Under Austroads, adopting the 16% of AADT to estimate peak traffic flows, the daily peak will be just over 200 vehicles per hour.
- Page 12 - traffic volumes using the existing access is shown as 16 vehicles per day. Are these 16 vehicles likely to continue to access the site during construction works and if so, has this number been included in the modelling?
- Page 12 - 'Barrier Highway south of Gypsum Street'. Please clarify as Barrier Highway runs east/west and Gypsum Street runs north/south.
- Page 13 - transporting employees to site by bus from Broken Hill is supported by RMS. RMS is interested to be involved in and know where proposed parking stations/bus collection areas will be situated (Page 18) and subsequent (if any) impact on the classified road network. Additionally, details of how transportation by bus will be enforced to ensure bus use is effective and limits employee transportation to the site by private vehicle need to be included.
- Page 23 of the document recommends a BAR/BAL intersection at the solar plant access point onto the Barrier Highway. RMS reserves comment on this recommendation until background and turning traffic volumes are confirmed and a traffic safety assessment is conducted.

Adam, thank you for forwarding the draft TMP to RMS for early comment and I hope the above comments are helpful to finalise the document. I'm in meetings most of the day tomorrow, but should be available late afternoon should you wish to discuss any of the above.

Regards

Andrew McIntyre



Before printing, please consider the environment

IMPORTANT NOTICE: This email and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Roads and Maritime Services is not responsible for any unauthorised alterations to this email or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of Roads and Maritime Services. If you receive this email in error, please immediately delete it from your system and notify the sender. You must not disclose, copy or use any part of this email if you are not the intended recipient.

From: Matthew Gibson <MGibson@biosis.com.au>
Sent: Tuesday, 20 May 2014 3:34 PM
To: Shelley Anderson
Subject: FW: Broken Hill Solar Plant - Construction FLora and Fauna Management Plan

From: Peter Ewin [<mailto:Peter.Ewin@environment.nsw.gov.au>]
Sent: Tuesday, 20 May 2014 3:17 PM
To: Matthew Gibson
Cc: Michael Todd
Subject: RE: Broken Hill Solar Plant - Construction FLora and Fauna Management Plan

Matthew,

OEH has reviewed the Construction Environmental Management Plan (CEMP) - Sub-plan A- Flora and Fauna Management Plan and is satisfied that it meets the conditions of the Broken Hill Solar PV Power Station Project Approval (Application No.: MP10_0202).

At this stage, OEH has no further comment to make in regards to this development.

At this stage OEH has not contacted the Department of Planning and Environment to confirm this outcome – if you require this please let me know a contact and I will pass on this e-mail.

If you would like to discuss this response further please contact Mick Todd directly on 03 5021 8915.

Thanks,
Peter

Peter Ewin
Team Leader Planning, South West
Regional Operations Group (South Branch)
Office of Environment and Heritage
Ph: 02 6022 0606
Fax: 02 6022 0610
Mob: 0427 433 937

From: Matthew Gibson [<mailto:MGibson@biosis.com.au>]
Sent: Friday, 16 May 2014 9:33 AM
To: Ewin Peter
Cc: 'mcwenvironmental@bigpond.com'; 'Jeff.McAuliffe@FIRSTSOLAR.COM'; 'Shelley.anderson@beca.com'
Subject: Broken Hill Solar Plant - Construction FLora and Fauna Management Plan

Hi Peter,

Please find attached the Flora and Fauna Management Plan Section of the Construction Environmental Management Plan for the Broken Hill Solar Plant. We have also attached a separate figure specifying the extent of vegetation clearance. This will be the basis of the figure included in the final plan.

Could you please arrange for this to be reviewed by the appropriate person by 22nd May, as we must have the endorsed plan completed by the end of the month.

Please give me a call if you would like to discuss,

Regards,

Matt

Matthew Gibson
Ballarat Resource Group Manager
Mobile: 0418 522 401
Email: mgibson@biosis.com.au



Leaders in Ecology and Heritage Consulting

506 Macarthur Street (PO Box 18N) Ballarat VIC 3350

ph: (03) 5331 7000 fax: (03) 5331 7033

www.biosis.com.au

The information transmitted including attachments is intended only for the person or entity to which it is addressed and may contain copyright material, or information that is confidential or is exempt from disclosure by law. Any review, retransmission, dissemination or other use of, or taking of any action in reliance upon this information by persons or entities other than the intended recipient is strictly prohibited. If you received this in error, please contact the sender and delete the material from your computer. The views expressed in this email are those of the sender except where the sender expressly and with authority states them to be the views of Biosis Pty Ltd. Biosis Pty Ltd does not represent that this email is free of errors, viruses or interference. When using email to communicate with Biosis Pty Ltd, access to that information by Biosis Pty Ltd personnel is strictly limited and controlled.

This email is intended for the addressee(s) named and may contain confidential and/or privileged information.

If you are not the intended recipient, please notify the sender and then delete it immediately.

Any views expressed in this email are those of the individual sender except where the sender expressly and with authority states them to be the views of the Office of Environment and Heritage, NSW Department of Premier and Cabinet.

PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS EMAIL

Shelley Anderson

From: MCINTYRE Andrew R <Andrew.MCINTYRE@rms.nsw.gov.au>
Sent: Thursday, 8 May 2014 9:03 PM
To: Adam Mackett
Cc: Development Western; SULICICH Joe
Subject: AGL SOL - Broken Hill Solar Plant - First Solar Traffic Management Plan (TMP) - Draft (RMS Comments)

Adam

Thanks for your return call and sorry we keep missing each other.

The draft TMP has been reviewed by RMS and the following comments are made:

- Page 5 of the document states that a second CEMP will be prepared and submitted at a later date for grid connection traffic generation/management. Will this work overlap with construction works and regardless of whether it does or does not, is this traffic generation likely to require further intersection improvements? Why can't the entire traffic generation (ie construction, grid connection, etc) all be included in the one TMP?
- Page 7 of the document states consultation with RMS has not yet occurred (as required by the consent) to determine haulage routes. The draft TMP provides haulage routes from Melbourne, Newcastle and Adelaide to the site. Is this considered to be the consultation? How firm are these routes?
- Page 12 provides highway traffic volumes in and around Broken Hill. These numbers seem very low. For example, at a location on the Barrier Highway west of Broken Hill and west of the subject land, RMS estimate (based on historical counts) is an AADT of 1264 vehicles compared to AADT 466 provided in the draft TMP. Where was this figure obtained from? Under Austroads, adopting the 16% of AADT to estimate peak traffic flows, the daily peak will be just over 200 vehicles per hour.
- Page 12 - traffic volumes using the existing access is shown as 16 vehicles per day. Are these 16 vehicles likely to continue to access the site during construction works and if so, has this number been included in the modelling?
- Page 12 - 'Barrier Highway south of Gypsum Street'. Please clarify as Barrier Highway runs east/west and Gypsum Street runs north/south.
- Page 13 - transporting employees to site by bus from Broken Hill is supported by RMS. RMS is interested to be involved in and know where proposed parking stations/bus collection areas will be situated (Page 18) and subsequent (if any) impact on the classified road network. Additionally, details of how transportation by bus will be enforced to ensure bus use is effective and limits employee transportation to the site by private vehicle need to be included.
- Page 23 of the document recommends a BAR/BAL intersection at the solar plant access point onto the Barrier Highway. RMS reserves comment on this recommendation until background and turning traffic volumes are confirmed and a traffic safety assessment is conducted.

Adam, thank you for forwarding the draft TMP to RMS for early comment and I hope the above comments are helpful to finalise the document. I'm in meetings most of the day tomorrow, but should be available late afternoon should you wish to discuss any of the above.

Regards

Andrew McIntyre



Before printing, please consider the environment

IMPORTANT NOTICE: This email and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Roads and Maritime Services is not responsible for any unauthorised alterations to this email or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of Roads and Maritime Services. If you receive this email in error, please immediately delete it from your system and notify the sender. You must not disclose, copy or use any part of this email if you are not the intended recipient.

David Hudson

From: STEWART Angela <Angela.STEWART@rms.nsw.gov.au> on behalf of Development Western <development.western@rms.nsw.gov.au>
Sent: Monday, September 08, 2014 3:00 PM
To: Adam Mackett
Cc: information@planning.nsw.gov.au
Subject: AGL SOL - Broken Hill Solar Plant - First Solar Traffic Management Plan (TMP) Rev F - RMS Approval
Attachments: MP10_0202 Broken Hill.pdf

Good Afternoon,

Please find attached Roads and Maritime's response to your referral.

The original letter is in the mail.

Regards

Angela Stewart
Administration Assistant
Network Management | Journey Management
T (02) 6861 1467
www.rms.nsw.gov.au
Every journey matters

Roads and Maritime Services
Level 1 51-55 Currajong Street Parkes NSW 2870



Before printing, please consider the environment

IMPORTANT NOTICE: This email and any attachment to it are intended only to be read or used by the named addressee. It is confidential and may contain legally privileged information. No confidentiality or privilege is waived or lost by any mistaken transmission to you. Roads and Maritime Services is not responsible for any unauthorised alterations to this email or attachment to it. Views expressed in this message are those of the individual sender, and are not necessarily the views of Roads and Maritime Services. If you receive this email in error, please immediately delete it from your system and notify the sender. You must not disclose, copy or use any part of this email if you are not the intended recipient.





WST11/00034/08

Mr Adam Mackett
Manager Power Development
AGL Energy Ltd
Locked Bag 1837
ST LEONARDS NSW 2065

Dear Mr Mackett

MP10_0202: Part Lot 6806 DP 823918 (Western Lands Lease 1420); Barrier Highway (HW8), Broken Hill; Solar Photovoltaic Power Plant; Transport Management Plan

Thank you for your email on 26 August 2014 seeking an adequacy review of the *Construction Traffic Management Plan – Revision F (TMP)* prepared by First Solar dated 18 August 2014. Reference is also made to a site inspection attended by you and Roads and Maritime Services' staff Joe Sulicich, Anna Cook and Andrew McIntyre on 4 September 2014.

The TMP has been reviewed and Roads and Maritime is satisfied that it identifies the volume and management of traffic accessing the site as required under Condition C3(e) of MP10_0202.

Condition B31 of MP10_0202 requires the intersection of the site access road and the Barrier Highway to be upgraded to the satisfaction of Roads and Maritime prior to the commencement of construction works. Following inspection of the site and review of the TMP, the intersection treatment is required to be upgraded to include the following:

- A Basic Right (BAR) turn treatment as shown in Figure 7.5 of the *Austrroads Guide to Road Design: Part 4A* (copy enclosed) in the Barrier Highway at its intersection with the vehicular access servicing the site. The widened shoulder shall be sealed and built for an 110km/h speed environment to provide a reasonable level of safety for vehicles (up to 36.5 metres long) turning right into the access and to allow following vehicles (up to 36.5 metres long) an area to pass the right turning vehicle on the left hand side.
- A Rural Auxiliary Left Turn Treatment – Short Turn Lane [AUL(S)] is to be provided in the Barrier Highway generally in accordance with Figure 8.3 of *Austrroads Guide to Road Design 2010 – Part 4A* (copy enclosed) and Roads and Maritime Supplements.

Note: Roads and Maritime is willing to consider a shorter left turn treatment than required under Figure 8.3 of Austrroads Guide to Road Design 2010 – Part 4A to negate the widening of the culvert and associated infrastructure east of the site access intersection with the Barrier Highway.

- The width of the access road at the approach and connection to the Barrier Highway shall be wide enough to accommodate the simultaneous passing of turning road train vehicles. The access road shall be sealed a minimum of 40 metres from the edge of hold line.

Roads and Maritime Services

The Barrier Highway is a state road and the developer will be required to undertake private financing and construction of works on a road in which Roads and Maritime has a statutory interest. A formal agreement in the form of a Works Authorisation Deed (WAD) is required between the developer and Roads and Maritime prior to works commencing. A WAD Information Pack has been sent to you and it is understood that you are in the process of entering into a WAD with Roads and Maritime to progress these works. Please also note that a Road Occupancy Licence may be required before any works commence within 3 metres of the travel lanes in the Barrier Highway. To determine if a licence is required please contact the Traffic Operations Manager on (02) 6861 1686.

I trust this information is of assistance. Should you require further information please contact Andrew McIntyre on (02) 6861 1453.

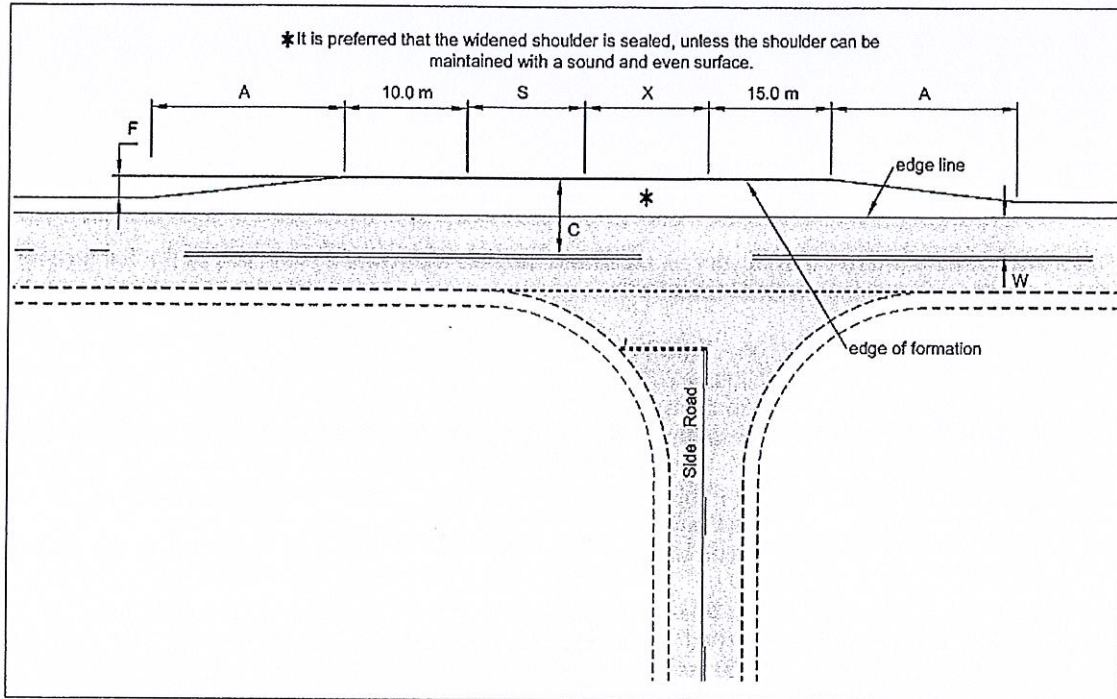
Yours faithfully



Susie Mackay
Network & Safety Manager
Western

08/09/14

cc Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001



Notes:

1. This treatment applies to the right turn from a major road to a minor road.

2. The dimensions of the treatment are defined thus:

W = Nominal through lane width (m) (including widening for curves). Width to be continuous through the intersection.

C = On straights – 6.5 m minimum

7.0 m minimum for Type 1 & Type 2 road trains

On curves – widths as above + curve widening (based on widening for the design turning vehicle plus widening for the design through vehicle).

$$A = \frac{0.5VF}{3.6}$$

Increase length A on tighter curves (e.g. those with a side friction demand greater than the maximum desirable). Where the design through vehicle is larger than or equal to a 19 m semi-trailer the minimum speed used to calculate A is 80 km/h.

V = Design speed of major road approach (km/h).

F = Formation/carrageway widening (m).

S = Storage length to cater for one design turning vehicle (m) (minimum length 12.5 m).

X = Distance based on design vehicle turning path, typically 10–15 m.

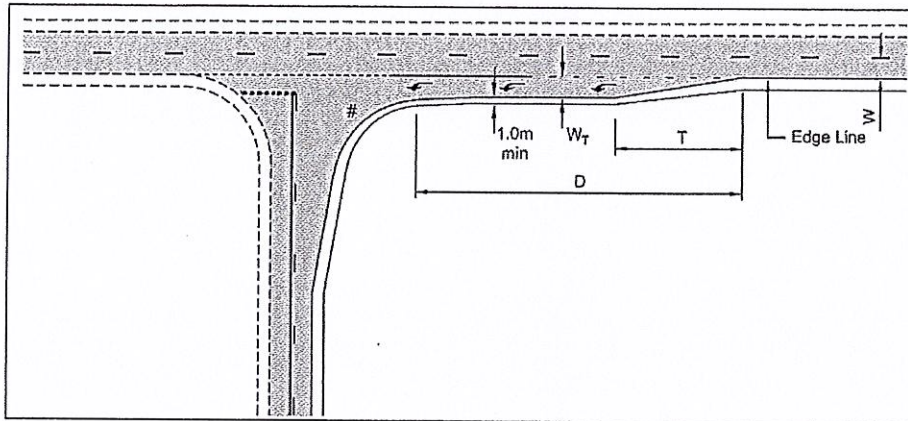
Source: QDMR (2006).

Figure 7.5: Basic right (BAR) turn treatment on a two-lane rural road

8.2.2 Rural Auxiliary Left-turn Treatment – Short Turn Lane [AUL(S)] on the Major Road

An AUL(S) turn treatment is shown in Figure 8.3. This treatment is suitable where there are low to moderate through and turning volumes (Section 4.8). For higher volume sites, a full-length AUL turn treatment is preferred. The required length of treatment is shown in Table 8.2.

The AUL(S) layout should not be used where there is reduced visibility to the turn treatment. Left-turning drivers on the major road need to perceive the location of the deceleration lane and the side road in time to make the necessary speed reduction in the through lane prior to diverging.



Notes:

1. # for setting out details of the left-turn geometry, use vehicle turning path templates and/or Table 8.2.
2. Approaches to left-turn slip lanes can create hazardous situations between cyclists and left-turning motor vehicles. Treatments to reduce the number of potential conflicts at left-turn slip lanes are given in this guide.
3. The dimensions of the treatment are defined as follows. Values of D and T are provided in Table 8.2.
 - W = Nominal through lane width (m) (including widening for curves). For a new intersection on an existing road, the width is to be in accordance with the current link strategy.
 - WT = Nominal width of the turn lane (m), including widening for curves based on the design turning vehicle = 3.0 m minimum.
 - T = Physical taper length (m) given by:

$$T = \frac{0.5VF}{3.6}$$

V Design speed of major road approach (km/h).

Source: QDMR (2006).

Figure 8.3: Rural AUL(S) treatment with a short left-turn lane

David Hudson

From: Thangavel, Vikram <Vikram.Thangavel@brokenhill.nsw.gov.au>
Sent: Friday, September 26, 2014 8:32 AM
To: Jeff McAuliffe
Cc: Turlough Guerin; David Hudson
Subject: RE: FIRST SOLAR Transport Management Plan update - Agency consultation

Hi Jeff

I would like to confirm that the revised CEMP is acceptable.

Regards

Vikram Thangavel
Graduate Engineer, Broken Hill City Council
240 Blende Street Broken Hill NSW 2880 Australia
P. (08) 8080 3373
W. www.brokenhill.nsw.gov.au
E. Vikram.Thangavel@brokenhill.nsw.gov.au



DISCLAIMER

This e-mail message and any accompanying attachments may contain information that is confidential and subject to legal privilege. If you are not the intended recipient do not read, use, disseminate, distribute or copy this message or attachments.

If you have received this message in error, please notify the sender immediately and delete this message. Views expressed in this e-mail are those of the individual, except where specifically stated otherwise.

Broken Hill City Council does not warrant this message to be free of errors, interference or viruses.

From: Jeff McAuliffe [mailto:Jeff.McAuliffe@FIRSTSOLAR.COM]
Sent: Friday, 26 September 2014 8:20 AM
To: Thangavel, Vikram
Cc: Turlough Guerin; David Hudson
Subject: RE: FIRST SOLAR Transport Management Plan update - Agency consultation

Hey Vikram,

Thank you for your swift reply. We have now included the additional council approvals item (b) into the original letter below (blue lettering). Could you please review and quickly approve this revised letter?

Thanking you kindly,

Jeff McAuliffe

Project Manager | First Solar (Australia) Pty Ltd.
| M +61 427 254 489 | F +61 2 9241 2129
Level 3, 16 Spring Street, Sydney NSW, 2000 Australia



 Please consider the environment before printing this e-mail.

From: Thangavel, Vikram [<mailto:Vikram.Thangavel@brokenhill.nsw.gov.au>]
Sent: Friday, 26 September 2014 8:00 AM
To: Jeff McAuliffe
Cc: Turlough Guerin; David Hudson
Subject: RE: FIRST SOLAR Transport Management Plan update - Agency consultation

Hi Jeff
Please note the following changes
Could you also add in point (B) getting approval from Council for oversize/overmass movement within NSW

With the above changes the proposed CEMP is acceptable.

Regards

Vikram Thangavel
Graduate Engineer, Broken Hill City Council
240 Blende Street Broken Hill NSW 2880 Australia
P. (08) 8080 3373
W. www.brokenhill.nsw.gov.au
E. Vikram.Thangavel@brokenhill.nsw.gov.au



DISCLAIMER

This e-mail message and any accompanying attachments may contain information that is confidential and subject to legal privilege. If you are not the intended recipient do not read, use, disseminate, distribute or copy this message or attachments.

If you have received this message in error, please notify the sender immediately and delete this message. Views expressed in this e-mail are those of the individual, except where specifically stated otherwise.

Broken Hill City Council does not warrant this message to be free of errors, interference or viruses.

From: Jeff McAuliffe [<mailto:Jeff.McAuliffe@FIRSTSOLAR.COM>]
Sent: Thursday, 25 September 2014 2:58 PM
To: Thangavel, Vikram

Cc: David Hudson; Turlough Guerin; Jeff McAuliffe

Subject: FIRST SOLAR Transport Management Plan update - Agency consultation

Dear Vikram Thangavel
Graduate Engineer
Broken Hill City Council
240 Blende Street
(PO Box 448)
Broken Hill
NSW 2880

Dear Vikram,

Thank you kindly for your attendance with First Solar's environmental advisor, David Hudson, earlier this day. As discussed, and as part of agency consultation for our Construction Environmental Management Plan (CEMP), we propose to make general deliveries/vehicle movements to our construction site located approximately 5km outside town along the Barrier Highway, route A32, (west towards Adelaide) for various vehicle classification sizes as follows:

- A) For any 'non-oversized' vehicle movements from anywhere within Australia – including the following vehicle categories
1. Light Vehicles: Project vehicles utes etc.;
 2. Crew Buses: Staff transport only to/from Broken Hill City;
 3. Light Service Trucks: The service truck dimensions are 8.8m in length and in 2.5m in width;
 4. Standard Articulated Trucks: The truck dimensions are 19m in length and 2.5m in width. **Please note: no load width will be greater than the truck width, i.e. 2.5m, or of a mass that categorises it as an 'Oversized' / 'Overmass' vehicle.**
- B) For any 'Oversized' vehicle/load vehicle movements from anywhere within New South Wales
First Solar will make a separate contact/application with Roads & Maritime Services (RMS), NSW and obtain approval from each Council for oversize/over-mass movement along the route within NSW.
- C) For any 'Oversized' vehicle/load deliveries originating from anywhere other than New South Wales, e.g. Adelaide/ South Australia and/or Melbourne / Victoria
First Solar will make a separate contact/application with the National Heavy Vehicle Regulator (NHVR). In this event we understand that the NHVR will itself contact the Broken Hill City Council, and any other councils/agencies as appropriate, for these proposed vehicle movements.

It is further noted that Council is currently undertaking city centre roadworks along Iodide Street (north of Blende Street) and, for this roadworks construction period, any approved oversized vehicle movements should be diverted from Melbourne (Route B79 to avoid entering the city centre areas) and travel in the following sequence as advised this day by Messrs. Vikram Thangavel & David Miranda (Broken Hill City Council);,

- From the B79 and continue straight through the roundabout and left onto Comstock St
- Then right onto Eyre St. and continue along Holton Drive
- Turn left onto the Menindee Road and head north into the city.
- Turn left onto Crystal St veering left along the South Silver city Road Highway.
- Turn (veer) right onto Gaffney St and then right onto Creedon St
- Upon reaching the Barrier highway (A32), turn left

The Sydney based vehicles should also follow the above sequence after the Menindee Road intersection (with another possibility of turning left on the next intersection at Iodide Street)

We trust that this meets with Council's satisfaction and would be most grateful if Council could give immediate confirmation that this proposal to our CEMP is acceptable. We respectfully look forward to receiving a (brief) written response today if possible (please cc David Hudson and Turlough Guerin).

With much thanks,

Yours sincerely

Jeff McAuliffe

Project Manager | First Solar (Australia) Pty Ltd.

| M +61 427 254 489 | F +61 2 9241 2129

Level 3, 16 Spring Street, Sydney NSW, 2000 Australia



 Please consider the environment before printing this e-mail.

From: Andrew Bell <andrew.bell@crowmland.nsw.gov.au>
Sent: Thursday, 29 May 2014 12:28 PM
To: Shelley Anderson
Cc: Shaun Barker
Subject: RE: 2584379 Broken Hill Solar PV Power Station - Ground Cover Management Plan

Hi Shelly,

The consultant you have engaged appears to have adequate experience in the required field and we do not require a copy of the Plan prior to submission to Planning. In my view, this would be interference with the Planning process. If NSW Planning seeks our advice on the adequacy of the Plan prior to making a determination, we will provide that advice at that time.

Regards

Andrew Bell | Senior Area Manager Far West and Western Lands Commissioner
NSW Trade & Investment, Crown Lands
45 Wingewarra St | Dubbo NSW 2830
PO Box 2185 | Dangar NSW 2309
T: 02 6883 5401 | M: 0409 100 587 | E: andrew.bell@crowmland.nsw.gov.au
W: www.crowmland.nsw.gov.au

From: Shelley Anderson [mailto:shelley.anderson@beca.com]
Sent: Tuesday, 27 May 2014 4:51 PM
To: 'andrew.bell@lands.nsw.gov.au'
Subject: 2584379 Broken Hill Solar PV Power Station - Ground Cover Management Plan

Good afternoon Andrew

My name is Shelley Anderson from Beca. We are currently finalising the CEMP for the Broken Hill Solar PV Power Station, on behalf of First Solar.

I understand you spoke to Steve Mason from our office earlier this year? (our notes indicate mid-January – contact details Andrew Bell , ph: 02 68835401).

Steve contacted you to discuss the use of agronomist to prepare the ground cover management sub-plan. Our understanding from this conversation was that other suitably qualified professionals that were familiar with local conditions would be appropriate for consultation during plan development.

For your information, the details and qualifications of the person we have consulted with are provided at the end of this email. We are seeking to finalise the plan this week but have realised that you may need to review prior to submission to the Department of Planning and Infrastructure.

Could you please advise on the following:

- Whether you have any concerns about Matt's suitability for input to the ground cover management plan
- Whether you need to review the plan prior to submission Planning and Infrastructure
- Whether this review could be returned by end of Thursday?

Thanks a lot for your time,
Shelley Anderson

Matt Gibson

Senior Botanist Biosis Pty Ltd

Matthew has a broad knowledge and understanding of environmental issues and conservation management, as well as being familiar with the rangelands of western NSW . Matthew has excellent plant identification skills across a wide range of environments, as well as undertaking monitoring, habitat hectare assessments, condition assessment, mapping, analysis of biodiversity data and targeted searching for rare and threatened species. He also has extensive experience as a Consultant in natural resource management projects involving stakeholder consultation and interactions between managing authorities. Matt has a detailed understanding of biodiversity legislation and in Victoria, is a DSE Certified Habitat Hectares Assessor.

Matt's particular experience within western NSW includes-

- Vegetation survey and condition monitoring of 100 sites over three years on a range of land tenures in what was formerly the Lower Murray Darling catchment. Application of vegetation condition methods including Landscape Function Analysis (2006-2010 for the Lower Murray Darling Catchment Management Authority)
- Flora survey and vegetation mapping of conservation reserves in western New South Wales. Surveys conducted at Gundabooka National Park, Peery National Park, Mungo National Park, Tarawi Nature Reserve, Paroo-Darling National Park and Kinchega National Park (1993 - 2008 for the New South Wales Parks and Wildlife Service)
- Flora and fauna surveys of rangeland grazing stations within western NSW, including Nanya, Nagaela, Loch Lily, Ennisvale and Tararra.
- Vegetation mapping using satellite image analysis of south-west NSW and NW Victoria for SunRise 21 and RMAP.
- Flora and fauna surveys and vegetation mapping for the Murray-Darling Water Management Action Plan, Natural Resources Study.

Shelley Anderson

Associate - Environmental Scientist

Beca

Phone +61 7 3117 6300 Fax +61 7 3117 6311

Mobile +61 428 138 491

shelley.anderson@beca.com

www.beca.com

NOTICE: This email, if it relates to a specific contract, is sent on behalf of the Beca company which entered into the contract. Please contact the sender if you are unsure of the contracting Beca company or visit our web page <http://www.beca.com> for further information on the Beca Group. If this email relates to a specific contract, by responding you agree that, regardless of its terms, this email and the response by you will be a valid communication for the purposes of that contract, and may bind the parties accordingly.

This e-mail together with any attachments is confidential, may be subject to legal privilege and may contain proprietary information, including information protected by copyright. If you are not the intended recipient, please do not copy, use or disclose this e-mail; please notify us immediately by return e-mail and then delete this e-mail.

This message is intended for the addressee named and may contain confidential information. If you are not the intended recipient, please delete it and notify the sender. Views expressed in this message are those of the individual sender, and are not necessarily the views of their organisation.

Summary of Consultation undertaken with Agencies on Bushfire and Waste Management (April/May 2014)

Organisation	Consultation	Response	Contact Person	Contact Person Details Email and Location
Broken Hill Fire Station	Discussed planned bushfire management	Understood and agreed with general principles and management measures within the Sub-plan. Offered to store a set of keys to the site as they would be the first responder in an incident. Have offered to do a site inspection early in the construction phase to assist with the preparation of an incident checklist and a management plan.	Gary Price (Firefighter)	02 8087 4419
New South Wales Region Fire Service	Discussed planned bushfire management	Understood and agreed with the principles and management measures contained within the Sub-plan. Agreed that Broken Hill Fire Station would be first responder.	Chris Favelle Manager – Far West Division	02 6836 1226 Chris.favelle@rfs.nsw.gov.au
Broken Hill Waste Management	Discussed planned waste management strategy. Discussed capacity and services available of the Broken Hill City Council Landfill and Waste Depot.	Provided advice on the Broken Hill City Council Landfill and Waste Depot and it's services. Agreed with waste management principles contained within Sub-plan. Provided input on potential facilities for contaminated waste (likely Adelaide).	Chris Manoel (Waste Services Supervisor)	0458242190