



Scatec Solar  
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# BASIC ASSESSMENT REPORT

Basic Assessment for the proposed development of a 115 MW Solar Photovoltaic (PV) Facility and associated electrical infrastructure (i.e. Kenhardt PV 4), north-east of Kenhardt, in the Northern Cape



## APPENDIX F: ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

# CONTENTS

<b>1.</b>	<b>INTRODUCTION</b>	<b>3</b>
1.1	PROJECT DESCRIPTION	6
1.2	AUTHORS OF THE EMPr	Error! Bookmark not defined.
1.3	IMPACTS IDENTIFIED DURING THE BA PROCESS	Error! Bookmark not defined.
<b>2.</b>	<b>APPROACH TO PREPARING THE EMPR</b>	<b>7</b>
2.1	COMPLIANCE WITH RELEVANT LEGISLATION	7
2.2	COMPLIANCE WITH DEFF REQUIREMENTS	Error! Bookmark not defined.
2.3	CONTENTS OF THE EMPr	11
2.4	GOAL FOR ENVIRONMENTAL MANAGEMENT	Error! Bookmark not defined.
<b>3.</b>	<b>ROLES AND RESPONSIBILITIES</b>	<b>12</b>
3.1	PROJECT DEVELOPER	Error! Bookmark not defined.
3.2	ENVIRONMENTAL CONTROL OFFICER	Error! Bookmark not defined.
3.3	CONSTRUCTION MANAGER	Error! Bookmark not defined.
<b>4.</b>	<b>ALIEN INVASIVE VEGETATION MANAGEMENT PLAN</b>	<b>ERROR! BOOKMARK NOT DEFINED.</b>
<b>5.</b>	<b>PLANT RESCUE AND PROTECTION PLAN INCLUDING RE-VEGETATION AND HABITAT REHABILITATION PLAN (INCLUDING AQUATIC ECOLOGY, FRESHWATER RESOURCES, AND TERRESTRIAL AND AQUATIC FAUNA AND FLORA)</b>	<b>ERROR! BOOKMARK NOT DEFINED.</b>
<b>6.</b>	<b>OPEN SPACE MANAGEMENT PLAN</b>	<b>ERROR! BOOKMARK NOT DEFINED.</b>
<b>7.</b>	<b>TRAFFIC MANAGEMENT PLAN INCLUDING TRANSPORTATION PLAN</b>	<b>ERROR! BOOKMARK NOT DEFINED.</b>
<b>8.</b>	<b>STORM WATER MANAGEMENT PLAN</b>	<b>ERROR! BOOKMARK NOT DEFINED.</b>
<b>9.</b>	<b>EROSION MANAGEMENT PLAN</b>	<b>ERROR! BOOKMARK NOT DEFINED.</b>
<b>10.</b>	<b>HAZARDOUS SUBSTANCES LEAKAGE OR SPILLAGE MONITORING SYSTEM</b>	<b>ERROR! BOOKMARK NOT DEFINED.</b>
<b>11.</b>	<b>ENVIRONMENTAL AWARENESS AND FIRE MANAGEMENT PLAN</b>	<b>ERROR! BOOKMARK NOT DEFINED.</b>
<b>12.</b>	<b>SPECIFIC PROJECT RELATED ENVIRONMENTAL IMPACTS</b>	<b>ERROR! BOOKMARK NOT DEFINED.</b>
<b>13.</b>	<b>APPENDIX A – SITE LAYOUT MAP</b>	<b>138</b>
<b>14.</b>	<b>APPENDIX B –ENVIRONMENTAL SENSITIVITY MAP</b>	<b>139</b>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

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# TABLES

Table 1: Project components and respective specifications	<b>Error! Bookmark not defined.</b>
Table 2: The BA Management Team	<b>Error! Bookmark not defined.</b>
Table 3: Impacts Identified in the BA	<b>Error! Bookmark not defined.</b>
Table 4: Compliance with Section 24N of NEMA	8
Table 5: Compliance with Appendix 4 of the 2014 NEMA EIA Regulations (as amended on 7 April 2017)	10
Table 6: DEFF Requirements for the EMPr	<b>Error! Bookmark not defined.</b>

# FIGURES

Figure 1: Locality Map of the proposed Solar PV Facilities (showing affected farm portions)	5
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## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

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### 1. INTRODUCTION

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This Environmental Management Programme (EMPr) has been prepared as part of the requirements of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) Environmental Impact Assessment (EIA) Regulations promulgated in Government Gazette 40772 and Government Notice (GN) R326, R327, R325 and R325 on 7 April 2017. This EMPr is being submitted to the National Department of Environment, Forestry and Fisheries (DEFF) as part of the Application for Environmental Authorisation (EA) for the proposed development of a 115 MW Solar Photovoltaic (PV) Facility and associated electrical infrastructure (including a 132 kV overhead power line from the PV Facility to the Eskom Nieuwehoop Substation), near Kenhardt in the Northern Cape (Figure 1). The proposed project is referred to as Kenhardt PV 4, and the Project Applicant is Kenhardt PV 4 (Pty) Ltd.

As noted in the Basic Assessment (BA) Report, the Project Applicant is proposing to develop three solar PV facilities and associated electrical infrastructure, near Kenhardt in the Northern Cape. This EMPr only considers the proposed development of the proposed Kenhardt PV 4 project.

The proposed project falls entirely within the Renewable Energy Zone (REDZ) 7 (i.e. Upington REDZ), that was Gazetted in February 2018 by the Minister of Environmental Affairs. As noted in Government Notice 114, a BA Process in terms of Appendix 1 of the EIA Regulations (2014, as amended) will be undertaken for the proposed project, with a 57 day decision-making timeframe.

As part of the 2016 Electricity Grid Infrastructure (EGI) Strategic Environmental Assessment (SEA), a generic Environmental Management Programme (EMPr) was also compiled for the development and expansion of (a) overhead electricity transmission and distribution infrastructure; and (b) substation infrastructure for the transmission and distribution of electricity. On 2 March 2018, these two Generic EMPrs were gazetted in Government Gazette 41473, Government Notices 162 and 163, for public comment for a period of 45 days. On 22 March 2019, these two Generic EMPrs were gazetted for implementation in Government Gazette 42323, Government Notice 435.

Since the Generic EMPrs have been gazetted and are applicable to the proposed project, the following has been undertaken:

- The Generic EMPrs have been used as a baseline for the proposed project;
- Section 1 of Part B of the gazetted Generic EMPrs contains a pre-approved template with aspects that are common to the development of substation infrastructure and overhead transmission and distribution infrastructure. This section will be completed by the contractor, with each completed page signed and dated by the holder of the EA prior to commencement of the activity. This section will not be submitted to the DEFF as it has already been pre-approved gazetted. To allow Interested and Affected Parties (I&APs) access to the pre-approved EMPr template for consideration through the decision-making process, the template will be released with the Draft BA Report. It is included in Appendix A of this EMPr; however it is important to re-iterate that Appendix A is not available for comment as it has already been gazetted.
- Section 2 of Part B of the gazetted Generic EMPrs has been completed to include site specific information, a preliminary infrastructure layout and development footprint site map, and a declaration that the Applicant will comply with the pre-approved template provided in Part B: Section 1 of the gazetted EMPrs. This will be submitted to the DEFF for review and decision-making and has been included in Section 4 (site specific information), Section 5 (preliminary infrastructure layout) and Section 6 (declaration of the Applicant) of this EMPr.
- Part C of the gazetted Generic EMPr has been compiled and included in Section 7 of this EMPr. It includes site specific impact management outcomes and impact management actions that are not included in the pre-approved generic EMPr. It will be submitted to the DEFF together with the Draft

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

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BAR, for consideration of, and decision on, the Application for EA. This section has been prepared by an Environmental Assessment Practitioner (EAP), with input from relevant specialists. The details and expertise of the EAP are provided in Section 1.1 and Section 4 of this EMPr, with a Curriculum Vitae included in Appendix B of this EMPr.

Apart from the two generic EMPRs which were gazetted as noted above, Part C of the EMPr is a supplement to the gazetted EMPr and provides site specific mitigation measures identified in the specialist studies contained in Appendix C of the Draft BA Report. In addition, this EMPr contains all management actions that are not included in the two Generic EMPRs, such as management actions that relate to the construction, operation and decommissioning of the Solar PV Facility itself (i.e. all infrastructure other than the power line and on site substation). In some instances, the impact management outcomes listed in the generic EMPr are also listed in this project specific EMPr (Section 7) because they are more detailed.

This EMPr is being made available to I&APs, stakeholders and Organs of State, as part of the Draft BA Report that is currently being circulated for a 30-day review period. Comments received from stakeholders during this aforementioned review period will be incorporated into this EMPr, where applicable. This EMPr is intended as a “living” document and should continue to be updated regularly, as needed.

SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

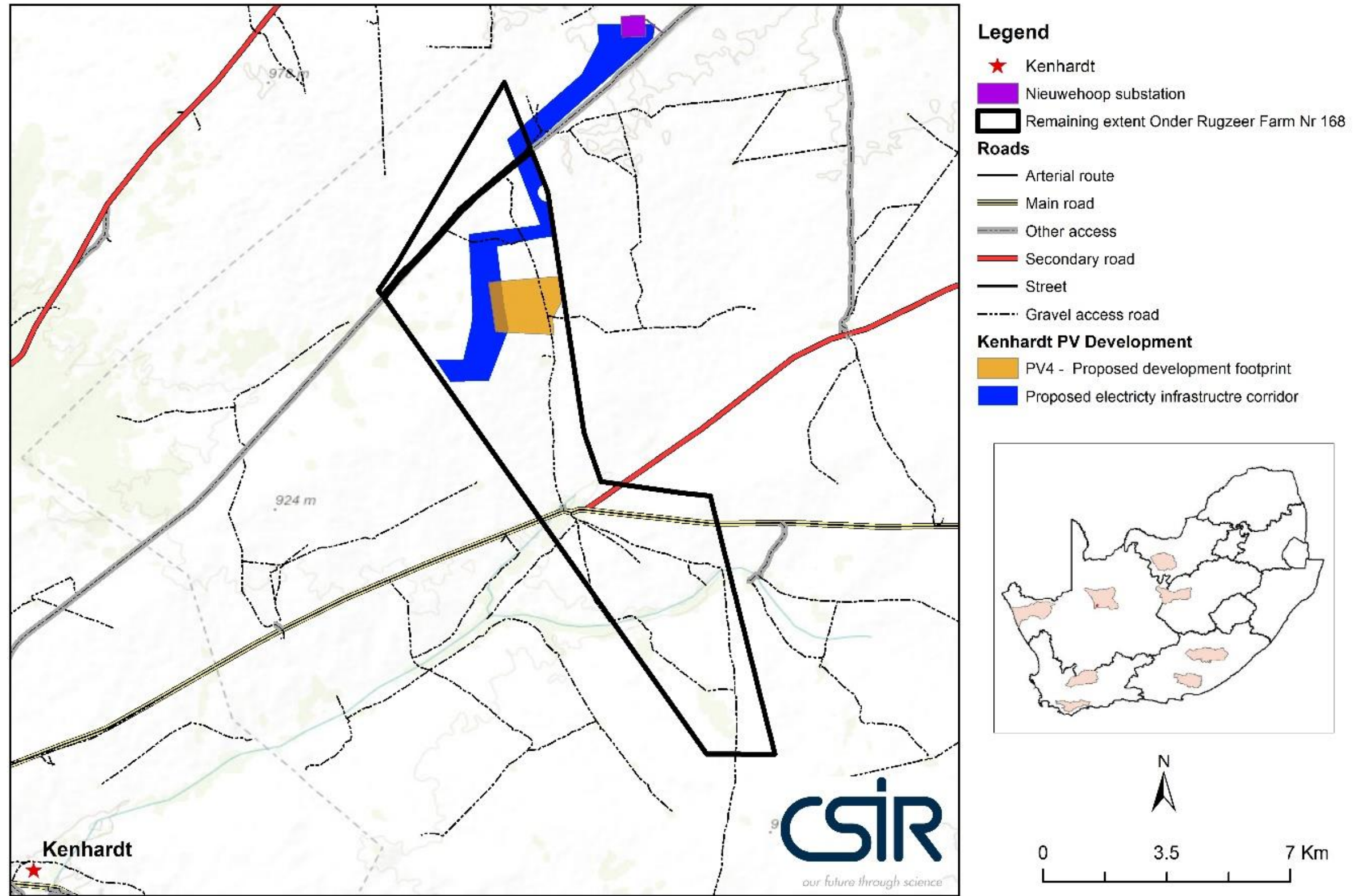


Figure 1: Locality Map of the proposed Solar PV Facility and Power Line (showing affected farm portions).

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

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### 1.1 AUTHORS OF THE EMPr

This EMPr has been compiled by the EAPs and the various specialists on the team (as indicated in Table 1). The details and expertise (including the Curriculum Vitae) of the EAPs and the specialists are respectively provided in Appendix A of this EMPr. A Declaration of Independence signed by the EAP (Kelly Stroebel) is included in Appendix E of the Draft BA Report.

The BA is being managed by the EAP, Kelly Stroebel. Kelly has more than 6 years of experience in environmental assessment and management and is an EAP in the Environmental Management Services (EMS) group of the CSIR with a Honours degree in Environmental Science from Rhodes University. She is a Registered Candidate Natural Scientist (Registration Number: 100151/14) with the South African Council for Natural Scientific Professions (SACNASP). Kelly has experience in the management and integration of various types of environmental assessments in South Africa for various sectors, including renewable energy, industry and oil & gas. Kelly has undertaken several Solar PV Environmental Assessments (i.e. EIAs, BAs, and Amendment and Appeal Processes) in the Northern Cape.

Kelly is supported by various project members within CSIR and specialists. The team which is involved in this BA Process is listed in Table A.1 below.

**Table 1. The BA Team**

Name	Organisation	Role/ Specialist Study
<b>CSIR Project Team</b>		
Kelly Stroebel <i>Cand.Sci.Nat.</i>	CSIR	EAP ( <i>Cand. Sci. Nat.</i> )
Paul Lochner	CSIR	Technical Advisor and Quality Assurance (EAPSA) Certified
Rohaida Abed <i>Pr.Sci.Nat.</i>	CSIR	Advisor
<b>Specialists</b>		
Quinton Lawson and Bernard Oberholzer	Quinton Lawson Architect (QARC) Bernard Oberholzer Landscape Architect (BOLA) (Sub-contracted by QARC)	Visual Impact Assessment
Jayson Orton	ASHA Consulting	Heritage Impact Assessment
John Almond	Natura Viva cc	Palaeontological Impact Assessment
Johann Lanz	Private	Soils and Agricultural Impact Assessment
Simon Bundy	Sustainable Development Projects cc	Ecological Impact Assessment (Terrestrial and Aquatic)
Chris van Rooyen	Chris van Rooyen Consulting	Avifauna Impact Assessment
Rudolph du Toit	Applied Science Associates (Pty) Ltd	Socio-economic Impact Assessment
Catherine Bilankulu	WSP	Traffic Impact Statement

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

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### 1.2 ENVIRONMENTAL SENSITIVITIES

Section D of the Draft BA Report provides a description of the environmental features and sensitive areas that were identified by the specialists for consideration in the layout and location of the proposed project (refer to the specialist studies in Appendix C of the Draft BA Report for more details on the environmental sensitivities identified). The relevant and significant environmental features and no-go areas that were identified in the specialist studies have been mapped and included in Appendix C of this EMPr. Based on this and the findings of the specialist studies, a combined environmental sensitivity map overlain with the project layout has also been produced, and included in Appendix D of this EMPr. These maps show the relevant environmental features and sensitivities found on site (in terms of terrestrial, aquatic, visual, heritage and avifaunal features).

### 1.3 IMPACTS IDENTIFIED DURING THE BA PROCESS

Based on the specialist studies, the main direct potential impacts, have been identified in **Section D of the Draft BA Report** and appropriate management and mitigation measures included within the EMPr (where required) as per the recommendations made in the specialist studies to ensure the potential impacts are suitably addressed and managed during all phases of the project. Indirect and cumulative impacts are noted in Section 7 of this EMPr. It should be noted that other impacts for which specialist studies were not undertaken but where mitigation or management actions may be required, are also included in the EMPr.

## 2. APPROACH TO PREPARING THE EMPr

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### 2.1 COMPLIANCE WITH RELEVANT LEGISLATION

In terms of legal requirements, a crucial objective of the EMPr is to satisfy the requirements of the following:

- Section 24N of the NEMA, as amended;
- Appendix 4 of the amended NEMA EIA Regulations published in Government Notice No. R 326 of 7 April 2017. These regulations regulate and prescribe the content of the EMPr and specify the type of supporting information that must accompany the submission of the report to the authorities; and
- Gazetted generic EMPrs for the power line and substation infrastructure.

As noted in the Gazetted EMPrs noted above (dated March 2019), the NEMA requires that an EMPr be submitted where a BA or EIA is being undertaken for an Application for EA. The content of an EMPr must either contain the information set out in Appendix 4 of the 2014 NEMA EIA Regulations (as amended) promulgated in Government Gazette 40772 and GN R326 on 7 April 2017, or must be a generic EMPr relevant to an application as identified and gazetted by the Minister in a government notice. As noted above, two generic EMPrs for the development of overhead electricity transmission and distribution infrastructure, as well as substation infrastructure for the transmission and distribution of electricity were gazetted in March 2019. It is therefore understood that these gazetted EMPrs must be applied by all parties involved in the EA Process. This EMPr therefore subscribes to the requirements of the gazetted EMPrs (Gazette 42323, Government Notice 435). However, it also subscribes to Appendix 4 of the 2014 NEMA EIA Regulations to cover all project components that are not covered by the Generic EMPrs of Government Notice 435 - this specifically includes the proposed PV facility.

An overview of where the requirements are addressed in this EMPr is presented in Tables 3 and 4.



## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

**Table 4: Compliance with Section 24N of NEMA**

Requirements of Section 24N of NEMA	Where it is included in this EMPr?
<p>2) The environmental management programme must contain-</p> <p>a) information on any proposed management, mitigation, protection or remedial measures that will be undertaken to address the environmental impacts that have been identified in a report contemplated in subsection 24(1A), including environmental impacts or objectives in respect of:</p> <ul style="list-style-type: none"> <li>(i) planning and design;</li> <li>(ii) pre-construction and construction activities;</li> <li>(iii) the operation or undertaking of the activity in question;</li> <li>(iv) the rehabilitation of the environment; and</li> <li>(v) closure, if applicable;</li> </ul>	Columns detailing the impact description, mitigation and management objectives, and mitigation and management actions in Section 7 of this EMPr.
<p>b) details of-</p> <ul style="list-style-type: none"> <li>(i) the person who prepared the environmental management programme; and</li> <li>(ii) the expertise of that person to prepare an environmental management programme;</li> </ul>	Section 1.2 of this EMPr and Appendix E of the BA Report
<p>c) a detailed description of the aspects of the activity that are covered by the environmental management programme;</p>	Section 1 and Section 1.1
<p>d) information identifying the persons who will be responsible for the implementation of the measures contemplated in paragraph (a);</p>	Columns in Section 7 of the EMPr regarding the monitoring responsibility, including the requirements for monitoring and reporting on compliance and the responsible parties noted in Section 3.
<p>e) information in respect of the mechanisms proposed for monitoring compliance with the environmental management programme and for reporting on the compliance;</p>	The columns detailing the mitigation and management actions, and the monitoring methodology, frequency and responsibility in Sections 7 of this EMPr.
<p>f) as far as is reasonably practicable, measures to rehabilitate the environment affected by the undertaking of any listed activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and</p>	Sections 7 of this EMPr, as applicable to the post-construction, rehabilitation phase and the decommissioning phase.
<p>g) a description of the manner in which it intends to-</p> <ul style="list-style-type: none"> <li>(i) modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;</li> <li>(ii) remedy the cause of pollution or degradation and migration of pollutants; and</li> <li>(iii) comply with any prescribed environmental management standards or practices.</li> </ul>	The columns detailing the mitigation and management objectives, mitigation and management actions, and the monitoring methodology, frequency and responsibility in Sections 7 of this EMPr.
<p>3) The environmental management programme must, where appropriate-</p> <ul style="list-style-type: none"> <li>a) set out time periods within which the measures contemplated in the environmental management programme must be implemented;</li> <li>b) contain measures regulating responsibilities for any environmental damage, pollution, pumping and treatment of polluted or extraneous water or ecological degradation which may occur inside and outside the boundaries of the operations in question; and</li> <li>c) develop an environmental awareness plan describing the manner in which- <ul style="list-style-type: none"> <li>(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and</li> </ul> </li> </ul>	The columns detailing the mitigation and management actions, and the monitoring methodology, frequency and responsibility in Sections 7 of this EMPr, including an Environmental Awareness Plan.

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Requirements of Section 24N of NEMA	Where it is included in this EMPr?
(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment.	
5) The Minister, the Minister responsible for mineral resources or an MEC may call for additional information and may direct that the environmental management programme in question must be adjusted in such a way as the Minister, the Minister responsible for mineral resources or the MEC may require.	Not applicable at this stage.
6) The Minister, the Minister responsible for mineral resources or an MEC may at any time after he or she has approved an application for an environmental authorisation approve an amended environmental management programme.	Not applicable at this stage.
7) The holder and any person issued with an environmental authorisation- a) must at all times give effect to the general objectives of integrated environmental management laid down in section 23; b) must consider, investigate, assess and communicate the impact of his or her prospecting or mining on the environment; c) must manage all environmental impacts (i) in accordance with his or her approved environmental management programme, where appropriate; and (ii) as an integral part of the prospecting or mining, exploration or production operation, unless the Minister responsible for mineral resources directs otherwise; d) must monitor and audit compliance with the requirements of the environmental management programme; e) must, as far as is reasonably practicable, rehabilitate the environment affected by the prospecting or mining operations to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and f) is responsible for any environmental damage, pollution, pumping and treatment of polluted or extraneous water or ecological degradation as a result of his or her operations to which such right, permit or environmental authorisation relates.	Throughout the EMPr
8) Notwithstanding the Companies Act, 2008 (Act No. 71 of 2008), or the Close Corporations Act, 1984 (Act No. 69 of 1984), the directors of a company or members of a close corporation are jointly and severally liable for any negative impact on the environment, whether advertently or inadvertently caused by the company or close corporation which they represent, including damage, degradation or pollution.	Section 3 details the responsibility of the Project Applicant.

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

**Table 5: Compliance with Appendix 4 of the 2014 NEMA EIA Regulations (as amended on 7 April 2017)**

Requirements of Appendix 4 of the 2014 NEMA EIA Regulations (as amended on 7 April 2017 in GN R326)	Where it is included in this EMPr?
1. (1) An EMPr must comply with section 24N of the Act and include:	Section 1.2 of this EMPr and Appendices E of the <b>BA Report</b> . Appendix H of the <b>BA Report</b> includes the Curriculum Vitae of the Environmental Assessment Practitioners and specialists respectively.
a) details of:	
(i) the EAP who prepared the EMPr; and	
(ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;	
b) a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 1 and Section 1.1
c) a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	Appendix Appendix B and C of this EMPr
d) a description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including:	Columns detailing the impact description, mitigation and management objectives, and mitigation and management actions in Section 7 of this EMPr.
(i) planning and design;	
(ii) pre-construction activities;	
(iii) construction activities;	
(iv) rehabilitation of the environment after construction and where applicable post closure; and	
(v) where relevant, operation activities;	
f) a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraphs (d) will be achieved, and must, where applicable, include actions to:	The columns detailing the mitigation and management actions in Sections 7 of this EMPr.
(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	
(ii) comply with any prescribed environmental management standards or practices;	
(iii) comply with any applicable provisions of the Act regarding closure, where applicable; and	
(iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	
g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	The columns detailing the monitoring methodology in Sections 7 of this EMPr.
h) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	The columns detailing the monitoring frequency in Sections 7 of this EMPr.
i) an indication of the persons who will be responsible for the implementation of the impact management actions;	The columns detailing the monitoring responsibility in Sections 7 of this EMPr.
j) the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	The columns detailing the mitigation and management actions, and the monitoring methodology and frequency in Sections 7 of this EMPr.
k) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	The columns detailing the mitigation and management actions, and the monitoring methodology, frequency and responsibility in Sections 7 of this EMPr.
l) a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Section 7 of the EMPr, including the requirements for monitoring and reporting

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Requirements of Appendix 4 of the 2014 NEMA EIA Regulations (as amended on 7 April 2017 in GN R326)	Where it is included in this EMPr?
	on compliance and the responsible parties noted in Section 3.
m) an environmental awareness plan describing the manner in which: <ul style="list-style-type: none"> <li>(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and</li> <li>(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and</li> </ul>	Section 7.8 of this EMPr.
n) any specific information that may be required by the competent authority.	Section 2.2 and the management objectives and management actions in Section 7. It should be noted that this is based on previous renewable energy projects and corresponding feedback from the DEFF.
(2) Where a government notice <i>gazetted</i> by the Minister provides for a generic EMPr, such generic EMPr as indicated in such notice will apply.	Government Notice 435 includes two gazetted generic EMPrs for power lines and substation infrastructure. This EMPr complies with this Government Notice for the power line and substation component. The EMPr complies with Section 24N and Appendix 4 of the EIA Regulations for all other project components excluding the power lines and substations, such as the PV facility.

### 2.2 STRUCTURE AND CONTENTS OF THE EMPr

This Site Specific EMPr includes the following:

- Section 4: Site specific information;
- Section 5: Preliminary infrastructure layout and development footprint site map;
- Section 6: Declaration that the Applicant will comply with the pre-approved template provided in Part B: Section 1 of the gazetted EMPrs (which are included in Appendix A of this EMPr);
- Section 7: Site-Specific EMPr as required by Part C of the gazetted EMPrs. This section includes the following:
  - Management actions that are not covered in the Generic EMPrs for the power line and substation component; and
  - Management actions that are related to the PV facility, which are not covered in the Generic EMPrs for the power line and substation component.

The Site-Specific EMPr follows the same template as that of Part B - Section 1 of the gazetted EMPrs, as recommended. Where applicable, each section of the Site-Specific EMPr is divided into the following four phases of the project cycle:

- Design Phase;
- Construction Phase;
- Operational Phase; and
- Decommissioning Phase.

The EMPr includes the findings and recommendations of the BA Process and specialists studies. Furthermore, as noted above, the EMPr is considered a “living” document and must be updated with

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

additional information or actions during the design, construction, operational and decommissioning phases if applicable.

The EMPr follows an approach of identifying an over-arching goal and objectives, accompanied by management actions that are aimed at achieving these objectives. The management actions are presented in a table format in order to show the links between the goal and associated objectives, actions, responsibilities, and monitoring requirements and targets. The overall goal for environmental management for the proposed Kenhardt PV 4 project is to construct and operate the project in a manner that:

- Minimises the ecological footprint of the project on the local environment;
- Minimises impacts on fauna, flora and aquatic ecosystems;
- Facilitates harmonious co-existence between the project and other land uses in the area; and
- Contributes to the environmental baseline and understanding of environmental impacts of PV facilities and associated supporting EGI in a South African context.

### 3. ROLES AND RESPONSIBILITIES

The generic roles and responsibilities required for key role players are those of the:

- Developer's Project Manager (DPM);
- Developer Site Supervisor (DSS)
- Environmental Control Officer (ECO);
- Developer's Environmental Officer (DEO);
- Contractor; and
- Contractor's Environmental Officer (CEO).

The definitions of the roles and responsibilities are noted in the gazetted EMPrs. This has been undertaken in order to avoid any contradiction. The parties managing the PV facility will be the same as those managing the power line and substation. Hence, the same roles and responsibilities are being assumed.

### 4. SITE SPECIFIC INFORMATION

#### 4.1 CONTACT DETAILS AND DESCRIPTION OF THE PROJECT

##### 4.1.1 Details of the Applicant

<b>Name of Applicant</b>	Kenhardt PV 4 (Pty) Ltd
<b>Name of Applicant Representative</b>	Mitchell Hodgson
<b>Telephone Number:</b>	072 810 2006
<b>Fax Number:</b>	-
<b>Postal Address:</b>	2nd Floor North Wing, 3 Dock Road, Waterway House, V&A Waterfront, Cape Town, 8001, South Africa
<b>Physical Address:</b>	2nd Floor North Wing, 3 Dock Road, Waterway House, V&A Waterfront, Cape Town, 8001, South Africa

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

### 4.1.2 Details and Expertise of the EAP

<b>Company of the EAP</b>	Council for Scientific and Industrial Research (CSIR)
<b>Name of EAP</b>	Kelly Stroebel
<b>Telephone Number:</b>	021 888 2432 or 021 888 2661
<b>Fax Number:</b>	021 888 2693
<b>Email Address:</b>	KStroebel@csir.co.za
<b>Expertise of the EAP (Curriculum Vitae included):</b>	<p><b>Qualifications:</b></p> <ul style="list-style-type: none"> <li>▪ BSc (Hons) Environmental Science</li> </ul> <p><b>Experience:</b></p> <ul style="list-style-type: none"> <li>▪ Kelly has more than 6 years of experience in environmental assessment and management.</li> </ul> <p><b>Professional Registration and Affiliations:</b></p> <ul style="list-style-type: none"> <li>▪ Registered Professional Natural Scientist with the South African Council for Natural Scientific Professions (Registration Number: 100151/14).</li> <li>▪ International Association for Impact Assessment, South African Affiliate (membership #: 3588).</li> </ul> <p><b>Curriculum Vitae of Kelly Stroebel is included in Appendix B of this EMPr.</b></p>

### 4.1.3 Project Name

<b>Project Name</b>	Basic Assessment for the proposed development of the 115 MW Solar Photovoltaic (PV) Facility and associated electrical infrastructure (i.e. Kenhardt PV 4), north-east of Kenhardt, in the Northern Cape
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### 4.1.4 Description of the Project

The proposed project will make use of PV solar technology to generate electricity from the sun's energy. The Applicant is proposing to develop a facility with a possible maximum installed capacity of 115 MW Direct Current (DC) which produces 100 MW Alternating Current (AC) of electricity from PV solar energy. Once a Power Purchase Agreement (PPA) is awarded, the proposed facility would generate electricity for a minimum period of 20 years. The property on which the solar PV facility is to be constructed will be leased by the Project Developer from the property owners for the life span of the project.

The proposed solar facility will consist of the following components listed below:

#### **Project Components**

- Solar Field, comprising Solar Arrays with a maximum height of 10 m and maximum footprint of 250 hectares per project (detailed provided below), including the following:
  - PV Modules;
  - Single Axis Tracking structures (aligned north-south), Fixed Axis Tracking (aligned east-west), Dual Axis Tracking (aligned east-west and north-south), Fixed Tilt Mounting Structure or Bifacial Solar Modules (all options will be considered in the design);
  - Solar module mounting structures comprised of galvanised steel and aluminium; and
  - Foundations which will likely be drilled and concreted into the ground.
- Building Infrastructure
  - Offices (maximum height 7 m and footprint of 1000 m<sup>2</sup>);

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

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- Operational and maintenance control centre (maximum height 7 m and footprint 500 m<sup>2</sup>);
- Warehouse/workshop (maximum height 7 m and footprint 500 m<sup>2</sup>);
- Ablution facilities (maximum height 7 m and footprint 50 m<sup>2</sup>);
- 24 converter/Inverter stations (height from 2.5 m to 7 m (maximum) and footprint 2500 m<sup>2</sup>);
- On-site substation building (footprint 20 000 m<sup>2</sup>).; and
- Guard Houses (height 3 m, footprint 40 m<sup>2</sup>).
- Associated Infrastructure
  - **132 kV overhead power line** to connect to the existing Eskom Nieuwehoop substation to be located within a corridor of approximately 300 m - 1000 m wide. The specific power line will have a following specifications:
    - Height = 22.5 m to 30 m
    - The servitude for the 132 kV power line will be 31 m wide. Note that the entire servitude will not be cleared of vegetation. Vegetation clearance within the servitude will be undertaken in compliance with relevant standards and specifications.
    - Length from site to grid connection = approximately 10km.
  - Associated electrical infrastructure at the Eskom Nieuwehoop Substation (including but not limited to feeders, Busbars, transformer bay and extension to the platform at the Eskom Nieuwehoop Substation);
  - On-site substation;
  - Internal 33 kV power lines/underground cables (either underground to maximum depth of 1.6 m or above ground with height of 9 m);
  - Underground low voltage cables or cable trays (underground to maximum depth of 1.4 m);
  - Access roads. Maximum 8 m wide. Total Length of Internal Gravel and Perimeter Roads Length: Approximately 20 000 m.
  - Internal gravel roads (width of 4 m);
  - Fencing (at least 2.6 - 3 m high) - Access points will be managed and monitored by an appointed security service provider. The type of fencing will either be of palisade, mesh type or a fully electrified option;
  - Panel maintenance and cleaning area;
  - Stormwater channels (Details to be confirmed once the Engineering, Procurement and Construction (EPC) contractor has been selected and the design is finalised. A detailed stormwater management plan would need to be developed); and
  - Temporary work area during the construction phase (i.e. laydown area of maximum 5 ha).

### Additional specifications

The proposed project can be divided into the following three main phases:

- Construction Phase;
- Operational Phase; and
- Decommissioning Phase.

Activities undertaken as part of the above phases may have environmental impacts and has therefore been assessed by the specialist studies (Appendix C of the BA Report).

It is proposed that the local municipality will provide services in terms of water, waste removal, and sewage for the construction phase of the proposed project. However, should the municipality not have adequate capacity available for the handling of waste and sewage, and the provision of water; then the Applicant will make use of private contractors to ensure that the services are provided. The Applicant will also ensure that adequate waste disposal measures are implemented by obtaining waste disposal dockets of waste and sewage that is removed from site. Any electricity required during the construction phase will

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

be generated through the use of onsite generators. During the operational phase, the project will not have any electricity requirements as the project itself will transmit and distribute electricity.

The construction phase will take place subsequent to the issuing of an EA from the DEFF and a successful off taker is selected. The construction phase is expected to extend for approximately 12 months.

The main activities that will form part of the construction phase are:

- Removal of vegetation for the proposed infrastructure;
- Excavations for infrastructure and associated infrastructure;
- Establishment of a laydown area for equipment;
- Stockpiling of topsoil and cleared vegetation;
- Creation of employment opportunities;
- Transportation of material and equipment to site, and personnel to and from site; and
- Construction of the solar field, 132 kV power line and additional infrastructure.

The following main activities will occur during the operational phase:

- Generation of 115 MW of electricity to add to the national grid;
- The transmission of electricity generated from the proposed Kenhardt PV 4 Solar Facility to the Eskom Nieuwehoop substation;
- Maintenance of the solar facility, including washing of panels; and
- Maintenance of the distribution line servitude including service road.

In the event of decommissioning, the main aim would be to return the land to its original, pre-construction condition. Should the unlikely need for decommissioning arise (i.e. if the actual SEF becomes outdated or the land needs to be used for other purposes), the decommissioning procedures will be undertaken in line with the EMP and any legislation or guidelines relevant at the time and the site will be rehabilitated and returned to its pre-construction state. Possible decommissioning activities will include removing the infrastructure, and covering the concrete footings with soil to a depth sufficient for the re-growth of natural vegetation. Any other supporting infrastructure no longer in use will be removed from the site and either disposed of at a registered disposal facility or recycled if possible.

It should be noted that a detailed project description (based on the conceptual design) is provided in Section A of the BA Report.

### 4.1.5 Project Location

The proposed project will take place on the following farms:

NUMBER	FARM NAME	FARM NUMBER	PORTION NAME	PORTION NUMBER	LATITUDE	LONGITUDE
1	Farm Onder Rugzeer 168	168	REMAINDER	0	XX	XX
2	Farm Gemsbok Bult 120	120	3	3	XX	XX
3	Farm Boven Rugzeer 169	169	REMAINDER	0	XX	XX
4	Farm Onder Rugzeer 168	168	4	4	XX	XX

Co-ordinates at regular points along the proposed power line and PV facility are provided in Section A.3 of the Draft BA Report.



## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

### 4.1.6 Preliminary Technical Specification of the Overhead Power Lines

The information provided below is based on conceptual design. Detailed design will only be available should the Project Applicant reach preferred bidder status.

Length	132 kV Power Line: XX km
<b>Tower Parameters - 132 kV Power Line</b>	
Number and Types of Towers	Monopole pylon structures or self-supporting suspension structures.
Tower Spacing (mean and maximum)	To be confirmed in the Final BA Report. The span lengths are estimated to range between 200 m and 300 m.
Tower Height (lowest, mean and height)	Range: 22.5 m to 30 m
Conductor Attachment Height (mean)	To be confirmed in the Final BA Report.
Minimum Ground Clearance	To be confirmed in the Final BA Report.

## 5. LAYOUT AND DEVELOPMENT FOOTPRINT SITE MAP

This section includes maps of combined features and sensitivities, as well as the preliminary infrastructure layout. The feature and sensitivity map was prepared based on specialist feedback and existing databases. At this stage, combined sensitivities and feature maps have been provided and included in this section. Individual feature and sensitivity maps are included in the specialist studies (Appendix C of the Draft BA Report). Individual feature maps for each specialist theme, where relevant, are also included in Part A of the Draft BA Report.

## 6. APPLICANT DECLARATION

The proponent/applicant or holder of the EA affirms that he/she will abide and comply with the prescribed impact management outcomes and impact management actions as stipulated in part B: section 1 of the generic EMP and have the understanding that the impact management outcomes and impact management actions are legally binding. The proponent/applicant or holder of the EA affirms that he/she will provide written notice to the CA 14 days prior to the date on which the activity will commence of commencement of construction to facilitate compliance inspections.

Signature Proponent/applicant/ holder of EA

Date:

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## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

### 7. SITE SPECIFIC EMPR

#### 7.1. ALIEN INVASIVE VEGETATION MANAGEMENT PLAN

Impact	Mitigation/ Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>A. DESIGN PHASE</b>					
4.1. Impacts due to establishment of alien invasive plants	Ensure the appropriate removal of alien invasive vegetation from the proposed project area and prevent the establishment and spread of alien invasive plants due to the project activities.	4.1.1. Ensure compliance with relevant Environmental Specifications for the control and removal of alien invasive plant species. 4.1.2. Appoint a specialist or contact relevant authorities to seek guidance on the removal of the alien vegetation on site. 4.1.3. Compile and finalise an alien weed eradication programme.	<ul style="list-style-type: none"> <li>▪ Appoint a suitable specialist/ Contractor or contact the relevant authorities to seek guidance on the removal of the planted alien invasive species.</li> <li>▪ Appoint a suitable specialist to compile an alien invasive vegetation eradication plan.</li> <li>▪ Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once-off during the design phase.</li> <li>▪ Once-off during the design phase.</li> <li>▪ Once-off during the design phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar)</li> <li>▪ Project Developer (Scatec Solar)</li> <li>▪ ECO</li> </ul>
<b>B. CONSTRUCTION PHASE</b>					
4.2. Impacts due to the establishment of and increased spread of alien invasive plants	Avoid establishment and reduce the spread of alien invasive plants due to the project activities.	4.2.1. Appoint a specialist or contractor to undertake a sweep and survey of the final development footprint site, with an alien invasive eradication team to remove exotic vegetation prior to the commencement of construction. 4.2.2. Establish an ongoing monitoring programme for the construction phase to detect and quantify any alien species that may become established and identify the problem species (as per Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA) and National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEM: BA)).	<ul style="list-style-type: none"> <li>▪ Appoint a suitable vegetation contractor to inspect the site and remove any exotic weeds prior to the commencement of construction. ECO to ensure that this is taken into consideration and implemented.</li> <li>▪ Prepare monitoring programme which will monitor the presence of alien invasive species on the site. If any alien invasive species are detected then the distribution of these should be mapped (GPS co-ordinates of concentrations of plants). The results should be interpreted in terms of the risk posed to sensitive habitats within and surrounding the project area.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Prior to the commencement of construction</li> <li>▪ Once-off</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar), ECO and Specialist Contractor</li> <li>▪ ECO and Contractor</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/ Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		4.2.3. Ensure proper management of soil stockpiles. Do not import soil stockpiles from areas with alien plants to ensure proper management of stockpiles.	<ul style="list-style-type: none"> <li>Monitor the presence of alien invasive plants during the construction phase via visual inspections and take action to remove and control these species.</li> </ul>	<ul style="list-style-type: none"> <li>On-going</li> </ul>	<ul style="list-style-type: none"> <li>ECO and Contractor</li> </ul>
		4.2.4. Undertake rehabilitation of disturbed areas as soon as possible after construction. Stockpile the shallow topsoil layer separately from the subsoil layers. Reinststate the topsoil layers (containing seed and vegetative material) when construction is complete to allow the plants to rapidly re-colonise the bare soil areas.	<ul style="list-style-type: none"> <li>Rehabilitate disturbed areas and monitor the presence of alien invasive species on site.</li> </ul>	<ul style="list-style-type: none"> <li>On-going</li> </ul>	<ul style="list-style-type: none"> <li>ECO and Contractor</li> </ul>
		4.2.5. Keep clearance and disturbance of indigenous vegetation to a minimum.	<ul style="list-style-type: none"> <li>Monitor and manage vegetation clearing by undertaking visual inspections to ensure minimal disturbance and to restrict activities to within demarcated areas.</li> </ul>	<ul style="list-style-type: none"> <li>On-going</li> </ul>	<ul style="list-style-type: none"> <li>ECO and Contractor</li> </ul>
		4.2.6. Ensure that the footprint required for the proposed project activities (such as temporary stockpiling, earthworks, storage areas, site establishment etc.) is kept at a minimum.	<ul style="list-style-type: none"> <li>Verify that the proposed project area is determined and outlined prior to the commencement of the construction phase by undertaking visual inspections.</li> </ul>	<ul style="list-style-type: none"> <li>Once-off prior to construction and as required during the construction process.</li> </ul>	<ul style="list-style-type: none"> <li>ECO and Contractor</li> </ul>
		4.2.7. Ensure that alien invasive vegetation found on site, within the proposed project footprint, is immediately controlled and removed promptly, in a scheduled manner throughout the construction phase. The removal of alien vegetation on site during the construction phase should use registered control methods and take into consideration the Alien and Invasive Species Regulations published in terms of Section 97(1) of the NEM: BA, if applicable.	<ul style="list-style-type: none"> <li>Monitor the presence of alien invasive plants during the construction phase via visual inspections and take action to remove and control these species. If any alien invasive species are detected then the distribution of these should be mapped (GPS co-ordinates of concentrations of plants). The results should be interpreted in terms of the risk posed to sensitive habitats within and surrounding the project area. Any alien invasive should be cleared from site.</li> </ul>	<ul style="list-style-type: none"> <li>On-going</li> </ul>	<ul style="list-style-type: none"> <li>ECO and Contractor</li> </ul>
		4.2.8. The removed alien invasive vegetation should be immediately disposed at a suitable waste disposal facility and should not be kept on site for prolonged periods of time, as this will enhance the spread of these species.	<ul style="list-style-type: none"> <li>Monitor the removal of the alien vegetation found on site via visual inspections.</li> </ul>	<ul style="list-style-type: none"> <li>As necessary during the construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/ Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		4.2.9. All construction machinery and plant equipment delivered to site for use during the construction phase should be cleaned in order to limit the introduction of alien species.	<ul style="list-style-type: none"> <li>▪ Clean machinery and equipment prior to the construction phase.</li> <li>▪ ECO to conduct visual inspections to verify that machinery and equipment are cleaned, and report any non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Prior to the commencement of construction.</li> <li>▪ As necessary during the construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO and Contractor</li> </ul>
<b>C. OPERATIONAL PHASE</b>					
4.3. Impacts due to establishment of alien invasive plants. Exotic weed invasion may result in the ousting of natural vegetation and alteration of ecological processes on site, with incremental impacts on the adjacent veld types.	Reduce the establishment and spread of alien invasive plants.  To remove exotic weeds as and when they may arise and thereby prevent alteration of local and adjacent habitat forms.	4.3.1. Continue with on-going monitoring programme to detect and quantify any alien species that may become established and identify the highly invasive species during the operation phase.	<ul style="list-style-type: none"> <li>▪ Annual audit of project area and immediate surroundings. If any alien invasive species are detected then the distribution of these should be mapped (GPS co-ordinates of concentrations of plants). The results should be interpreted in terms of the risk posed to sensitive habitats within and surrounding the project area.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Annual</li> </ul>	<ul style="list-style-type: none"> <li>▪ Operations and Maintenance Contractor</li> </ul>
		4.3.2. Immediately control any alien plants that become established using registered control methods. Use of herbicides and undertake manual removal of alien vegetation on site where this may arise. Regular address and redress of weeds identified on site by a suitable contractor. The clearance of exotic weed to be undertaken bi-annually at a minimum and on a needs basis at an intermittent level.	<ul style="list-style-type: none"> <li>▪ Monitor the use of herbicide sprays and manual removal of alien vegetation by undertaking visual inspections and reporting any non-compliance.</li> <li>▪ Maintain register of weed spraying activities and ensure that herbicide use is recorded.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Bi-annually</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar) and Environmental Manager</li> </ul>
<b>D. DECOMMISSIONING PHASE</b>					
4.4. Exotic weed invasion of the decommissioned site resulting in ecological change	To prevent the excessive growth and propagation of exotic weeds on disturbed lands that formed a portion	4.4.1. All natural areas must be rehabilitated with species indigenous to the area. Re-seed with locally-sourced seed of indigenous grass species that were recorded on site pre-construction.	<ul style="list-style-type: none"> <li>▪ Final external audit of area to confirm that area is rehabilitated to an acceptable level.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once off</li> </ul>	<ul style="list-style-type: none"> <li>▪ Lead Contractor with advice from specialist</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/ Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
	of the PV facility.	4.4.2. Exotic weed control measures to be instituted through weed control programme. Regular redress of exotic weed through the use of herbicide and manual removal.	<ul style="list-style-type: none"> <li>▪ Compile weed eradication programme for a period of 12 months after the decommissioning exercise.</li> <li>▪ Appoint contractor to undertake the weed eradication programme.</li> <li>▪ Monitor newly disturbed areas where infrastructure has been removed to detect and quantify any aliens that may become established after decommissioning and rehabilitation.</li> <li>▪ Final external audit of area to confirm that area is free of alien invasive plants after 5 years.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Weed eradication exercise to be undertaken every 6 months for a period of 12 months following decommissioning.</li> <li>▪ Prior to the commencement of the decommissioning phase.</li> <li>▪ Once-off</li> <li>▪ Once-off</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar)</li> <li>▪ Project Developer (Scatec Solar)</li> <li>▪ Facility Manager and Specialist/ Contractor</li> <li>▪ Facility Manager and Specialist/ Contractor</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

### 7.2. PLANT RESCUE AND PROTECTION PLAN INCLUDING RE-VEGETATION AND HABITAT REHABILITATION PLAN (INCLUDING FAUNA AND AVIFAUNA)

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>A. DESIGN PHASE</b>					
5.1. The ousting of fauna through anthropogenic activities, disturbance of refugia and general change in habitat, with impacts on terrestrial and aquatic ecology as a result of the final site layout and routes of the access roads.	Avoidance of unnecessary disturbance to the site and surrounds, and to establish buffers where required.	<p>5.1.1. Avoid of major drainage lines during the design and layout of the proposed PV facility. An Ecologist should be appointed to review the layout plan in relation to existing drainage lines and comment accordingly. Ensure that sensitive habitat and features (as defined in the Ecological Impact Assessment, Appendix C of the BA Report) are considered in the design.</p> <p>5.1.2. Incorporate minor drainage lines into design and avoid unnecessary disturbance, where applicable. Refer to Ecological Impact Assessment, Appendix C of the BA Report and Appendix B and C of this EMPr).</p> <p>5.1.3. Consider the most applicable access road to site (i.e. the unnamed farm road or the Transnet Service Road (subject to the discussions between the Applicant and Transnet Freight Rail)).</p> <p>5.1.4. Appoint a specialist or suitable contractor to identify any plant species on site that may require “rescue” as well as any exotic weeds/vegetation that require removal. Appoint a specialist team flush game from the construction area.</p> <p>5.1.5. Consideration of the siting and layout of the temporary construction site and worker camp.</p>	<ul style="list-style-type: none"> <li>▪ Review the site plan with the ECO and possibly an ecologist (if required).</li> <li>▪ Appoint a specialist to oversee the final development footprint area and undertake search and rescue, game sweep and alien removal.</li> <li>▪ Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once-off, prior to the commencement of construction.</li> <li>▪ Appoint specialist once-off, prior to the commencement of construction.</li> <li>▪ Once-off during the planning and design phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar) and ECO</li> <li>▪ Project Developer (Scatec Solar)</li> <li>▪ Project Developer (Scatec Solar)</li> </ul>
5.2. Destruction of indigenous vegetation.	Ensure compliance with relevant Provincial and National legislation in respect of habitat and vegetation forms.	<p>5.2.1. Ensure the necessary permits or licences are identified and applied for as applicable for removal of protected, indigenous vegetation.</p> <p>5.2.2. Await response and provision of permit (as required) from the relevant Authorities prior to the removal of the indigenous species (if required). Once these permits are obtained, search and rescue must be undertaken for the indigenous species.</p>	<ul style="list-style-type: none"> <li>▪ Review the findings of the Ecological Impact Assessment and consider legislative requirements in respect of loss of indigenous vegetation etc.</li> <li>▪ Contact the Provincial Department of Environment and Nature Conservation, and the Provincial Department of Agriculture, Forestry and Fisheries to discuss if any protected species need to be relocated or rescued.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once-off, prior to the commencement of construction</li> <li>▪ Once-off, prior to the commencement of construction</li> <li>▪ Once-off during the planning and</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar) and ECO</li> <li>▪ Project Developer (Scatec Solar), Specialist/ Contractor and ECO</li> <li>▪ Project Developer (Scatec Solar)</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
			<ul style="list-style-type: none"> <li>▪ Appoint a suitable Search and Rescue Specialist/Contractor to undertake Search and Rescue.</li> <li>▪ Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.</li> </ul>	design phase.	
5.3. Loss of Species of Special Concern (SSC) and protected species and their habitats.	Minimise fragmentation and loss of SSC and protected species and their habitats through the careful siting and layout planning for the project.	5.3.1. Avoid the removal of listed SSC and protected species as far as possible.	<ul style="list-style-type: none"> <li>▪ Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once-off during the planning and design phase</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar)</li> </ul>
		5.3.2. A buffer zone of 32 m must be implemented from the edge of the major drainage lines on site (as shown in Appendix B and C of this EMP), in which no development or activities should take place.	<ul style="list-style-type: none"> <li>▪ Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once-off during the planning and design phase</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar)</li> </ul>
5.4. Impact on avian behaviour and avian species as a result of collision with infrastructure of the proposed PV facility	Allocation of Bird Flight Diverters (BFDs) to powerlines.	5.4.1. Establish BFDs across powerlines at appropriate points.	<ul style="list-style-type: none"> <li>▪ Identify appropriate points within infrastructure for the establishment of BFDs.</li> <li>▪ Verify that this is undertaken by reviewing the signed approved designs.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once-off</li> <li>▪ Once-off</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar) and ECO</li> <li>▪ ECO</li> </ul>
<b>B. CONSTRUCTION PHASE</b>					
5.5. Excessive loss of natural vegetation in and outside the development footprint area and veld degradation	Minimise loss of natural vegetation.  Prevent impacts on natural vegetation in sensitive habitats and SSC.	5.5.1. Sensitive habitats and areas outside of the project development area should be clearly demarcated as no go areas during the construction phase to avoid accidental impacts. No development or activities should take place in the high sensitivity ecosystems (shown in Appendix B and Appendix C of this EMP).	<ul style="list-style-type: none"> <li>▪ Strict control over the behaviour of construction workers, restricting activities to within demarcated areas for construction.</li> <li>▪ ECO must monitor activities and record and report non-compliance</li> <li>▪ Strict control and proper education of staff to prevent misconduct. If ECO is absent, there should be a designated EO present to deal with any urgent issues.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO and Contractor</li> </ul>
		5.5.2. Ensure that the footprint required for the proposed project activities is kept at a minimum.	<ul style="list-style-type: none"> <li>▪ Verify that the proposed project area is determined and outlined prior to the commencement of the construction phase by undertaking visual</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once-off prior to construction and as required during the construction</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
			inspections.	process.	
		5.5.3. The proposed project footprint must be demarcated to reduce unnecessary disturbance beyond the proposed project area.	<ul style="list-style-type: none"> <li>▪ Carry out visual inspections to ensure strict control over the behaviour of staff in order to restrict activities to within demarcated areas.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> </ul>
		5.5.4. The Contractors and construction personnel must be made aware that indigenous vegetation must be not be removed or damaged (this includes succulents (e.g. <i>Hoodia gordonii</i> , <i>Euphorbia spp.</i> ) and the protected quiver tree, <i>Aloe dichotoma</i> .)	<ul style="list-style-type: none"> <li>▪ Carry out Environmental Awareness Training.</li> <li>▪ Conduct audits of the signed attendance registers.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once-off training and ensure that all new staff are inducted.</li> <li>▪ Monthly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor/ ECO</li> <li>▪ ECO</li> </ul>
		5.5.5. Ensure that the temporary site camp is established at least 32 m away from the banks of the major drainage lines.	<ul style="list-style-type: none"> <li>▪ Monitor the placement of the site camp via visual inspections, and record and report any non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once-off prior to construction and as required during the construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> </ul>
		5.5.6. Unnecessary impacts on surrounding natural vegetation must be avoided during construction. All construction vehicles should remain on properly and clearly demarcated roads.	<ul style="list-style-type: none"> <li>▪ Strict control over the behaviour of construction workers, restricting activities to within demarcated areas for construction.</li> <li>▪ Include periodical site inspection in environmental performance reporting that specifically records occurrence of off-road vehicle tracks in specific areas.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO and Contractor</li> </ul>
		5.5.7. Undertake rehabilitation of disturbed areas as soon as possible after construction. Stockpile the shallow topsoil layer separately from the subsoil layers. Reinststate the topsoil layers (containing seed and vegetative material) when construction is complete to allow the plants to rapidly re-colonise the bare soil areas. Re-seed with locally-sourced seed of indigenous grass species that were recorded on site during the pre-construction phase.	<ul style="list-style-type: none"> <li>▪ Undertake following the construction phase and report any non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO and Contractor</li> </ul>



## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		5.5.8. The collection, hunting or harvesting of any plants, fuel wood or animals at the site during construction should be strictly forbidden and the staff educated to prevent this from happening.	<ul style="list-style-type: none"> <li>▪ Strict control over the behaviour of construction workers, restricting activities to within demarcated areas for construction.</li> <li>▪ Carry out Environmental Awareness Training.</li> <li>▪ Conduct audits of the signed attendance registers.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily</li> <li>▪ Once-off training and ensure that all new staff are inducted.</li> <li>▪ Monthly</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO and Contractor</li> <li>▪ Contractor/ ECO</li> <li>▪ ECO</li> </ul>
		5.5.9. Fires should only be allowed within fire-safe demarcated areas. Open fires must be prohibited. Appropriate fire safety training should also be provided to staff that are to be on site for the duration of the construction phase.	<ul style="list-style-type: none"> <li>▪ Strict control over the behaviour of construction workers, restricting activities to within demarcated areas.</li> <li>▪ Ensure fire safety requirements are well understood and respected by workers (by providing basic fire safety training).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO and Contractor</li> </ul>
		5.5.10. Existing access roads/servitudes must be used and should be located along the boundaries of existing disturbed areas, if possible.	<ul style="list-style-type: none"> <li>▪ Compile plan pre-construction.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Prior construction to commencing</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar) and ECO</li> </ul>
5.6. Impact on indigenous vegetation, and on SSC and their habitats	To reduce negative impacts on and loss of indigenous vegetation and protected trees.  Minimise impacts on SSC and protected trees.	5.6.1. Appoint a specialist to undertake a second review and site visit of the final layout of the development footprint, possibly during the late summer period, in order to identify any plant species on site that may require “rescue” as well as any exotic weeds/vegetation that require removal.	<ul style="list-style-type: none"> <li>▪ Appoint an Ecologist to oversee the final development footprint area through a reconnaissance survey.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Prior to the commencement of construction</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar), Specialist and ECO</li> </ul>
		5.6.2. Identification of roadways and areas where extensive vegetation loss will result is required. Upon consideration, the avoidance of unnecessary clearance of vegetation on site should be undertaken through minor deviations to the design.	<ul style="list-style-type: none"> <li>▪ Review how larger vegetation will be dealt with by contractors.</li> <li>▪ Vegetation should be subject to redress when given a height that aligns with the lower limit of the PV array or when adjudged to affect construction.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ongoing</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO and Project Developer (Scatec Solar)</li> </ul>
		5.6.3. Ensure that the footprint required for the proposed project activities is kept at a minimum.			
		5.6.4. A plant rescue operation must be initiated to confirm that no other species are located within the development site.	<ul style="list-style-type: none"> <li>▪ ECO must undertake a final walkthrough of the site prior to commencement of construction to ensure no SCC will be impacted on</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once-off</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO and Contractor</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		5.6.5. Clearing of vegetation should be kept to a minimum, keeping the width and length of the earthworks to a minimum.	<ul style="list-style-type: none"> <li>Monitor activities and record and report non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>Daily</li> </ul>	<ul style="list-style-type: none"> <li>ECO and Contractor</li> </ul>
		5.6.6. Avoid the removal of listed SSC or protected species as far as possible. Should any of the listed/protected species need to be removed, the requisite permits must be obtained prior to the removal of the species.	<ul style="list-style-type: none"> <li>Monitor activities and record and report non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>Daily</li> </ul>	<ul style="list-style-type: none"> <li>ECO and Contractor</li> </ul>
5.7. Disturbance of terrestrial fauna and flora on site due to construction workers and activities.	To advise construction staff of the requirements in respect of management of flora and fauna on site during the construction phase.	5.7.1. Conduct an Environmental Awareness Training and induction for all construction staff and personnel.	<ul style="list-style-type: none"> <li>Carry out Environmental Awareness Training with a discussion on the management of terrestrial fauna and flora on site.</li> <li>Conduct audits of the signed attendance registers.</li> </ul>	<ul style="list-style-type: none"> <li>Prior to construction and as required by the ECO. Ensure that all new staff are inducted.</li> <li>Monthly</li> </ul>	<ul style="list-style-type: none"> <li>ECO and Contractor</li> <li>ECO</li> </ul>
5.8. Impact on fauna as a result of construction activities.	To identify any faunal mortalities and record the details (such as the reason, spatial extent etc.) in order to avoid repetition of fatality.	5.8.1. Establish a recording method in order to monitor the construction activities, including species presence within site, mortalities and sitings.	<ul style="list-style-type: none"> <li>Establish database of species, sitings etc.</li> <li>Construction personnel should advise on the findings and presence of fauna on site.</li> </ul>	<ul style="list-style-type: none"> <li>Daily to monthly</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> </ul>
	To remove species that may be found present in the construction footprint and laydown area.	5.8.2. Appoint a specialist to conduct an inspection of the final project area and sweep or inspect the site for any fauna, once the fencing is complete (i.e. the established site should be flushed to ensure any large wildlife is not contained within the fenced area). Appoint a small team to flush game during the early evening. Game should be flushed by driving a team through the gated facility towards the exit.	<ul style="list-style-type: none"> <li>Team to flush game as required.</li> <li>ECO to monitor flushing process and record any incidents or non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>Once off prior to commencement and thereafter if required.</li> </ul>	<ul style="list-style-type: none"> <li>ECO and Project Developer (Scatec Solar)</li> </ul>
		5.8.3. The Contractor or Contractors Environmental Officer should monitor trenches at the start and end of each working day to check if any small animals are trapped.	<ul style="list-style-type: none"> <li>Monitor activities and record and report non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>As required during construction</li> </ul>	<ul style="list-style-type: none"> <li>ECO and Contractor</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		5.8.4. No animals (including snakes) shall be killed on site. An expert or a suitable specialist should be appointed to remove and relocate any poisonous snakes during the construction phase.	<ul style="list-style-type: none"> <li>Monitor activities and record and report non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>As required during construction</li> </ul>	<ul style="list-style-type: none"> <li>ECO Contractor and</li> </ul>
5.9. Faunal and avifaunal road mortality as a result of increased vehicles travelling to and within the site.	Minimise loss of fauna as a result of road mortalities.	5.9.1. The construction personnel and staff should be made aware of the presence of fauna within the proposed project area. The construction personnel and staff must also be made aware of the general speed limits on site and must be alert at all times for potential crossings.	<ul style="list-style-type: none"> <li>Carry out Environmental Awareness Training.</li> <li>Conduct audits of the signed attendance registers.</li> </ul>	<ul style="list-style-type: none"> <li>Once-off training and ensure that all new staff are inducted.</li> <li>Monthly</li> </ul>	<ul style="list-style-type: none"> <li>ECO Contractor and</li> <li>ECO</li> </ul>
		5.9.2. To ensure that animals are not attracted to the site (and potentially resulting in increased road mortality), the waste collection bins and skips should be covered with suitable material, where appropriate, and the site camp must be kept clean on a daily basis.	<ul style="list-style-type: none"> <li>Monitor the activities via visual inspections, and record and report any non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>Daily</li> </ul>	<ul style="list-style-type: none"> <li>ECO Contractor and</li> </ul>
5.10. Impact and loss of fauna as a result of the fence line and exclusion of fauna from site resulting in ecological change within the site.	To reduce incidental mortality and injury of fauna within the construction area.	5.10.1. Ensure that the live electrical fence wire is not placed at ground level. 5.10.2. Conduct inspections of the fence line to address any animals that may be affected by the fence.	<ul style="list-style-type: none"> <li>Conduct regular (daily) inspections of the fence line to address any animals that may be affected by the fence.</li> </ul>	<ul style="list-style-type: none"> <li>Daily to monthly record keeping. A register of all faunal sightings indicating date of siting; species affected; position of species (specific or indicative) and other observations should be established.</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> </ul>
5.11. Increased ELP, leading to changes in nocturnal behavioural patterns amongst fauna	The avoidance of electrical light pollution through prudent positioning of external lighting.	5.11.1. Placement of lighting, particularly security lighting, to avoid excessive influence on surrounding areas. Placement of lighting to be judiciously considered at time of implementation.	<ul style="list-style-type: none"> <li>Review lighting plans and identify important habitat zones to be avoided.</li> </ul>	<ul style="list-style-type: none"> <li>Prior to the installation of lighting.</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar), Contractor and ECO</li> </ul>
<b>C. OPERATIONAL PHASE</b>					

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
5.12. Vegetation management on site	Manage vegetation throughout the site to avoid conflict with operations of the proposed PV facility. Excessive growth of vegetation on site may affect operations of the PV facility, while excessive clearance of vegetation on site has concomitant impacts on the land in question. Management of vegetation at an optimum level of growth and height is required.	5.12.1. Identify protocol for pruning of vegetation and clearance where required.  5.12.2. Identify level of pruning and vegetation management required.	<ul style="list-style-type: none"> <li>▪ Identify means of pruning and clearance of vegetation. For example, brushcutter, grazing etc.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ongoing and as required</li> </ul>	<ul style="list-style-type: none"> <li>▪ Environmental Manager</li> </ul>
5.13. Loss of SSC and their habitats	Control loss of natural vegetation during the operational phase.  Prevent impacts on natural vegetation in sensitive habitats and SSC.	5.13.1. Unnecessary impacts on surrounding natural vegetation must be avoided. All operational and maintenance vehicles to remain on the roads and no driving off road allowed. No unauthorized persons should be allowed onto the site.	<ul style="list-style-type: none"> <li>▪ Strict control over the behaviour of operation workers, restricting activities to within demarcated areas for operation. Strict control and proper education of staff to prevent misconduct.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monthly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Environmental Manager</li> </ul>
		5.13.2. The collection, hunting or harvesting of any plants, any protected trees, fuel wood or animals at the site should be strictly forbidden and the staff educated to prevent this from happening.	<ul style="list-style-type: none"> <li>▪ Strict control over the behaviour of construction workers, restricting activities to within demarcated areas for construction.</li> <li>▪ Carry out Environmental Awareness Training.</li> <li>▪ Conduct audits of the signed attendance registers.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily</li> <li>▪ Once-off training and ensure all new staff are inducted.</li> <li>▪ As required</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager and Environmental Manager</li> <li>▪ Facility Manager</li> <li>▪ Environmental Manager</li> </ul>
		5.13.3. All hazardous materials should be stored in the appropriate manner to prevent impacts on vegetation. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.	<ul style="list-style-type: none"> <li>▪ Monitor the activities via visual inspections, and record and report any non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily</li> </ul>	<ul style="list-style-type: none"> <li>▪ Environmental Manager</li> </ul>
		5.13.4. Fires should only be allowed within fire-safe demarcated areas. Open fires must be prohibited. Appropriate fire safety training should also be provided to staff that are to be on site for the duration of the operational phase.	<ul style="list-style-type: none"> <li>▪ Strict control over the behaviour of construction workers, restricting activities to within demarcated areas.</li> <li>▪ Ensure fire safety requirements are well understood and respected by workers (by providing basic fire safety</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager and Environmental Manager</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
			training).		
		5.13.5. A storm-water management plan must be implemented during the operational phase. Regular inspections of stormwater infrastructure should be undertaken to ensure that it is kept clear of all debris and weeds.	<ul style="list-style-type: none"> <li>▪ Verify that the stormwater management plan is being implemented and signed off prior the commencement of operations.</li> <li>▪ Undertake regular inspections of the stormwater infrastructure (i.e. by implementing walk through inspections).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Prior to commencement of operations.</li> <li>▪ Weekly/Monthly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Environmental Manager</li> <li>▪ Facility Manager</li> </ul>
		5.13.6. Undertake maintenance of rehabilitated areas in accordance with the rehabilitation and landscaping plan.	<ul style="list-style-type: none"> <li>▪ Monitor topsoil removal and rehabilitation activities, and record and report non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Weekly or Monthly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager and Environmental Manager</li> </ul>
		5.13.7. Continue with on-going monitoring programme to detect and quantify any alien species that may become established and identify the highly invasive species during the operation phase.	<ul style="list-style-type: none"> <li>▪ Monitor the presence of alien invasive species on the development site.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Reporting frequency depends on legal compliance framework</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager and Environmental Manager</li> </ul>
5.14. Impact and loss of fauna as a result of operational activities.	To reduce the loss of and impact on fauna.	<p>5.14.1. Prior to the commencement of the operational phase, the plant manager and the landowner need to reach a decision in terms of the allowance of faunal activities or redress of faunal activities within site.</p> <p>5.14.2. Identify points of excessive faunal activity and impact on operations. Undertake monitoring of faunal activities within the fenced area of the site and the immediate proximity of the site.</p> <p>5.14.3. Reduction in speed limits in and around site.</p>	<ul style="list-style-type: none"> <li>▪ Establish reporting procedure.</li> <li>▪ Monitor the presence of fauna during the operational phase via visual inspections and site visits.</li> <li>▪ Carry out Environmental Awareness Training.</li> <li>▪ Conduct audits of the signed attendance registers.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily</li> <li>▪ Daily</li> <li>▪ Once-off training and ensure all new staff are inducted.</li> <li>▪ As required</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager and Environmental Manager</li> <li>▪ Facility Manager and Environmental Manager</li> <li>▪ Facility Manager</li> <li>▪ Environmental Manager</li> </ul>
5.15. Impact and loss of fauna as a result of the fence line and exclusion of fauna from site resulting in ecological change within the site.	To reduce the impact and loss of fauna from site as a result of their exclusion from the area.	<p>5.15.1. Avoidance of damage to infrastructure by faunal activity as well as impact on fauna as a result of the site infrastructure.</p> <p>5.15.2. Identify impact of burrowing and other faunal activities on the fence line and operations activities.</p> <p>5.15.3. Undertake the management of faunal intrusion through the fence, including possible mortalities.</p> <p>5.15.4. Provide critter paths through the fence line to</p>	<ul style="list-style-type: none"> <li>▪ Identify where fauna may be affecting operations of site (burrows etc.) Consider redress if necessary.</li> <li>▪ Conduct regular (daily) inspections of the fence line to address any animals that may be affected by the fence.</li> <li>▪ Monitor the activities via visual inspections, and record and report any non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily to monthly record keeping.</li> <li>▪ A register of all faunal sightings indicating date of siting; species affected; position of species (specific or indicative) and other observations</li> </ul>	<ul style="list-style-type: none"> <li>▪ Environmental Manager and Project Developer (Scatec Solar)</li> <li>▪ Environmental Manager and Project Developer (Scatec Solar)</li> <li>▪ Environmental</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<p>allow species access to site.</p> <p>5.15.5. Ensure that the live electrical fence wire is not placed at ground level.</p> <p>5.15.6. Conduct inspections of the fence line to address any animals that may be affected by the fence.</p> <p>5.15.7. Promote and support faunal presence and activities within the proposed PV facility.</p>		<p>should be established.</p> <ul style="list-style-type: none"> <li>▪ Daily</li> </ul>	<p>Manager and Project Developer (Scatec Solar)</p>
5.16. Impact of ELP around the site.	The avoidance of electrical light pollution through prudent positioning of external lighting.	5.16.1. Placement of lighting, particularly security lighting to avoid excessive influence on surrounding areas.	<ul style="list-style-type: none"> <li>▪ Review lighting plans and identify important habitat zones to be avoided.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Prior to the installation of lighting.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar) and Environmental Manager</li> </ul>
5.17. Faunal and avifaunal road mortality as a result of increased vehicles travelling to and within the site.	Minimise loss of fauna as a result of road mortalities.	5.17.1. The operational personnel and staff should be made aware of the presence of fauna within the proposed project area. The operational personnel and staff must also be made aware of the general speed limits on site and must be alert at all times for potential crossings.	<ul style="list-style-type: none"> <li>▪ Carry out Environmental Awareness Training.</li> <li>▪ Conduct audits of the signed attendance registers.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once-off training and ensure that all new staff are inducted.</li> <li>▪ Monthly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager</li> <li>▪ Environmental Manager</li> </ul>
		5.17.2. To ensure that animals are not attracted to the site (and potentially resulting in increased road mortality), the waste collection bins and skips should be covered with suitable material, where appropriate, and the offices must be kept clean on a daily basis.	<ul style="list-style-type: none"> <li>▪ Monitor the activities via visual inspections, and record and report any non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO and Contractor</li> </ul>
<b>D. DECOMMISSIONING PHASE</b>					
5.18. Rehabilitation of flora on site	Re-vegetation of the disturbed site is aimed at approximating as near as possible the natural vegetative conditions prevailing prior to operation.	<p>5.18.1. All damaged areas shall be rehabilitated upon completion of the contract.</p> <p>5.18.2. All natural areas must be rehabilitated with species indigenous to the area. Re-seed with locally-sourced seed of indigenous grass species that were recorded on site pre-construction.</p> <p>5.18.3. Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas.</p>	<ul style="list-style-type: none"> <li>▪ Conduct a final external audit to confirm that area is rehabilitated to an acceptable level.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once off</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar) with feedback and input from an appropriate specialist. with advice from specialist</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

### 7.3. OPEN SPACE MANAGEMENT PLAN

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>A. DESIGN PHASE</b>					
6.1. Loss of vegetation and habitat fragmentation	Keeping the area cleared of vegetation to a minimum	6.1.1. Clearing of vegetation should be kept to a minimum and take into consideration the sensitivities on site shown in Appendices A and B of this EMPr.	<ul style="list-style-type: none"> <li>Ensure that solar panel/array design and layout is uniform and well-adapted to the surrounding environment and that no unnecessary areas are cleared of vegetation.</li> </ul>	Once-off during design	Project Developer (Scatec Solar)
6.2. Impacts due to establishment of alien invasive plants	Ensure the appropriate removal of alien invasive vegetation from the proposed project area and prevent the establishment and spread of alien invasive plants due to the project activities.	6.2.1. Ensure compliance with relevant Environmental Specifications for the control and removal of alien invasive plant species. 6.2.2. Appoint a specialist or contact relevant authorities to seek guidance on the removal of the alien vegetation on site. 6.2.3. Compile and finalise an alien weed eradication programme.	<ul style="list-style-type: none"> <li>Appoint a suitable specialist/ Contractor or contact the relevant authorities to seek guidance on the removal of the planted alien invasive species.</li> <li>Appoint a suitable specialist to compile an alien invasive vegetation eradication plan.</li> <li>Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.</li> </ul>	<ul style="list-style-type: none"> <li>Once-off during the design phase.</li> <li>Once-off during the design phase.</li> <li>Once-off during the design phase.</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> <li>Project Developer (Scatec Solar)</li> <li>ECO</li> </ul>
6.3. Permanent barriers to animal movement and habitat fragmentation	The reduction in the impact that barrier will have on animal movement within the area	6.3.1. Fencing should allow for the passage of small and medium sized mammals and all forms of mesh fencing should be avoided.	<ul style="list-style-type: none"> <li>Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.</li> </ul>	Once-off during the planning and design phase	Project Developer (Scatec Solar)
		6.3.2. All remaining areas that are not impacted upon by the proposed development footprint should remain unfenced to allow for movement corridors between the remainder of the farm.	<ul style="list-style-type: none"> <li>Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.</li> </ul>	Once-off during the planning and design phase	Project Developer (Scatec Solar)
		6.3.3. BFDs should be installed on the overhead cables where known flight paths of birds occur.	<ul style="list-style-type: none"> <li>Identify appropriate points within infrastructure for the establishment of BFDs.</li> <li>Verify that this is undertaken by reviewing the signed approved designs.</li> </ul>	<ul style="list-style-type: none"> <li>Once-off</li> <li>Once-off</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar) and ECO</li> <li>ECO</li> </ul>
<b>B. CONSTRUCTION PHASE</b>					
6.4. Permanent barriers	The reduction in the impact	6.4.1. BFDs should be installed on the overhead cables	<ul style="list-style-type: none"> <li>The flight paths and birds observed in the</li> </ul>	Daily	ECO and Contractor

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
to animal movement and habitat fragmentation	that barrier will have on animal movement within the area	where known flight paths of birds occur.	<ul style="list-style-type: none"> <li>area should be monitored by the ECO during the construction phase to determine where these measures should be installed.</li> <li>Verify whether these have been installed by inspecting the site prior to commencement of the operational phase.</li> </ul>	<ul style="list-style-type: none"> <li>Once-off</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> </ul>
		6.4.2. Fencing should allow for the passage of small and medium sized mammals and all forms of mesh fencing should be avoided.	<ul style="list-style-type: none"> <li>This should be monitored by the ECO to determine whether this is effective.</li> </ul>	<ul style="list-style-type: none"> <li>Daily</li> </ul>	<ul style="list-style-type: none"> <li>ECO and Contractor</li> </ul>
6.5. Loss of vegetation and habitat fragmentation	Keeping the area cleared of vegetation to a minimum	6.5.1. Clearing of vegetation should be kept to a minimum, keeping the width and length of the earthworks to a minimum.	<ul style="list-style-type: none"> <li>Monitor activities and record and report non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>Daily</li> </ul>	<ul style="list-style-type: none"> <li>ECO and Contractor</li> </ul>
<b>C. OPERATIONAL PHASE</b>					
6.6. Increased risk of alien plant invasion	Ensure that the site is kept free from alien invasive species.	6.6.1. Continuously monitor the site and remove alien invasive species that are found.	<ul style="list-style-type: none"> <li>Monitor the presence of alien invasive species on the development site.</li> </ul>	<ul style="list-style-type: none"> <li>Reporting frequency depends on legal compliance framework</li> </ul>	<ul style="list-style-type: none"> <li>Facility Manager and Environmental Manager</li> </ul>
6.7. Increased animal road mortality	Minimise loss of fauna as a result of road mortalities.	6.7.1. Create awareness during staff induction programmes. Staff must be made aware of the general speed limits as well as the potential animals that may cross and how to react in these situations.	<ul style="list-style-type: none"> <li>Conduct staff awareness training programmes.</li> </ul>	<ul style="list-style-type: none"> <li>Once-off training and ensure all new staff are inducted.</li> </ul>	<ul style="list-style-type: none"> <li>Facility Manager and Environmental Manager</li> </ul>
6.8. Permanent barriers to animal movement and habitat fragmentation	Avoid or reduce bird collisions with or due to infrastructure related to the project	6.8.1. The impact on birds must be monitored by environmental staff member during the first six months of the operational phase.	<ul style="list-style-type: none"> <li>Record any evidence of bird collisions, injury or other bird-related incidents (with GPS coordinates).</li> <li>Where necessary, a bird specialist should oversee the recording and reporting of incidents, help with species identification, assess the significance of any impacts, and if required, suggest mitigation.</li> </ul>	<ul style="list-style-type: none"> <li>Weekly for the first month, thereafter, monthly</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> </ul>
		6.8.2. Annual monitoring by an avifaunal specialist. This should be based on a minimum of 3-5 days observations.	<ul style="list-style-type: none"> <li>Monitor the flight paths of birds occurring on site, noting which birds are seen.</li> </ul>	<ul style="list-style-type: none"> <li>Annually</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> </ul>



## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		6.8.3. Any avian mortality or injury at the facility should be duly recorded and reported.	<ul style="list-style-type: none"> <li>Record any bird fatalities and undertake the necessary reporting to relevant authority.</li> </ul>	<ul style="list-style-type: none"> <li>When required</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> </ul>
<b>D. DECOMMISSIONING PHASE</b>					
6.9. No specific impacts are associated with the decommissioning phase other than those from the operational phase that will still be relevant for the duration of the decommissioning phase due to on-going occupation of the area.	To manage impacts on the surrounding environment during the operational phase.	6.9.1. Disturbed and transformed areas should be contoured to approximate naturally occurring slopes to avoid lines and forms that will contrast with the existing landscapes	<ul style="list-style-type: none"> <li>Final external audit of area to confirm that area is rehabilitated to an acceptable level</li> </ul>	<ul style="list-style-type: none"> <li>Once off</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> </ul>
		6.9.2. Stockpiled topsoil should be reapplied to disturbed areas and these areas should be re-vegetated using a mix of native species in such a way that the areas will form as little contrast in form, line, colour and texture with the surrounding undisturbed landscape.	<ul style="list-style-type: none"> <li>Final external audit of area to confirm that area is rehabilitated to an acceptable level</li> </ul>	<ul style="list-style-type: none"> <li>Once off</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> </ul>
		6.9.3. Edges of re-vegetated areas should be feathered to reduce form and line contrasts with surrounding undisturbed landscape.	<ul style="list-style-type: none"> <li>Final external audit of area to confirm that area is rehabilitated to an acceptable level</li> </ul>	<ul style="list-style-type: none"> <li>Once off</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

### 7.4. TRAFFIC MANAGEMENT PLAN INCLUDING TRANSPORTATION PLAN

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>A. DESIGN PHASE</b>					
7.1. Increased traffic generation	Manage impact that additional traffic generation will have on road network	7.1.1. If abnormal loads need to be transported by road to the site, a permit needs to be obtained from the Provincial Government Northern Cape (PGNC) Department of Public Works, Roads and Transport.	<ul style="list-style-type: none"> <li>Ensure that the permits are applied for and obtained prior to commencement.</li> <li>Verify that this has been undertaken by reviewing approved permits.</li> </ul>	<ul style="list-style-type: none"> <li>Once-off during the design phase</li> <li>Once-off during the design phase.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> <li>ECO</li> </ul>
		7.1.2. If the Transnet Service Road will be used as the designated access road to site, discussions must be held with Transnet Freight Rail prior to commencement to confirm requirements and details of the agreement.	<ul style="list-style-type: none"> <li>Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.</li> </ul>	<ul style="list-style-type: none"> <li>Once-off during the design phase.</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar) and ECO</li> </ul>
		7.1.3. Ensure that the requirements for use of the Transnet Service Road are addressed and considered in the design, as and where applicable.	<ul style="list-style-type: none"> <li>Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.</li> </ul>	<ul style="list-style-type: none"> <li>Once-off during the design phase.</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar) and ECO</li> </ul>
		7.1.4. If the Transnet Service Road will be used as the designated access road, the registration details of all vehicles that will make use of the road during the construction and operational phases must be provided to Transnet Freight Rail, in order to obtain official permits.	<ul style="list-style-type: none"> <li>Ensure that the permits are applied for and obtained prior to commencement.</li> <li>Verify that this has been undertaken by reviewing approved permits.</li> </ul>	<ul style="list-style-type: none"> <li>Once-off during the design phase</li> <li>Once-off during the design phase.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> <li>ECO</li> </ul>
		7.1.5. Provide a Transport Traffic Plan to SANRAL (if required).	<ul style="list-style-type: none"> <li>Ensure that the plan is compiled and submitted prior to commencement.</li> <li>Verify that this has been undertaken by reviewing approved plans.</li> </ul>	<ul style="list-style-type: none"> <li>Once-off during the design phase</li> <li>Once-off during the design phase.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> <li>ECO</li> </ul>
7.2. Accelerated degradation of road structure due to construction and operational traffic.	Limit the deterioration of the road condition due to construction and operational traffic.	7.2.1. A Road Maintenance Plan should be developed for the section of the Transnet Service Road that will be used. The plan should address the requirements of Transnet Freight Rail, including but not limited to, grading, dust	<ul style="list-style-type: none"> <li>Ensure that the plan is compiled and submitted prior to commencement.</li> <li>Verify that this has been undertaken by reviewing approved plans.</li> </ul>	<ul style="list-style-type: none"> <li>Once-off during the design phase</li> <li>Once-off during the design phase.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> <li>ECO</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		suppressant mechanisms, drainage, signage, and speed limits.			
<b>B. CONSTRUCTION PHASE</b>					
7.3. Increased traffic generation during the construction phase resulting in a reduction of road based level of service	Reduce the amount of road based traffic during the construction phase.	7.3.1. Well maintained vehicles should be used together with well-trained drivers during the construction phase. Vehicle maintenance and driver competency should be monitored. Proof of driver competency as well as the vehicle checks should be verified and undertaken to ensure that vehicles are roadworthy and hence, do not pose a safety risk. The Contractors must ensure that construction vehicles are roadworthy, properly serviced and maintained, and respect the vehicle safety standards implemented by the Project Developer.	<ul style="list-style-type: none"> <li>Carry out random checks of driver licenses and conduct random visual inspections of construction vehicles for roadworthiness.</li> </ul>	<ul style="list-style-type: none"> <li>Random visual inspection of vehicles weekly.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> </ul>
		7.3.2. Plan trips so that it occurs during the day but avoid construction vehicle movement on the regional road during peak time (06:00-10:00 and 16:00-20:00).	<ul style="list-style-type: none"> <li>Monitor and management of traffic generated and when trips are made.</li> </ul>	<ul style="list-style-type: none"> <li>During construction</li> </ul>	<ul style="list-style-type: none"> <li>Contractor and ECO</li> </ul>
		7.3.3. During the construction phase, suitable parking areas should be designated for trucks and vehicles.	<ul style="list-style-type: none"> <li>Monitor the placement of the designated parking area for trucks and vehicles via visual inspections and record and report any non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>Once-off prior to construction and as required during the construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar) and ECO</li> </ul>
		7.3.4. The use of public transport (buses and/or minibus taxis) to convey construction personnel to the site should be encouraged.	<ul style="list-style-type: none"> <li>Contractor may record arrival and departure times as well as number of workers using minibuses.</li> </ul>	<ul style="list-style-type: none"> <li>Once a month on a randomly selected day.</li> </ul>	<ul style="list-style-type: none"> <li>Appointed Contractor</li> </ul>
		7.3.5. It is recommended that vehicles are not overloaded during the construction phase in order to reduce impacts on the road structures, particularly the access roads leading to the site. Random visual inspection of vehicles should be undertaken in order to monitor for overloading. The inspections should also verify if the trucks are covered with appropriate material (such as tarpaulin) if and where possible.	<ul style="list-style-type: none"> <li>Perform visual inspection of vehicles during the construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>Random visual inspection of vehicles weekly.</li> </ul>	<ul style="list-style-type: none"> <li>Appointed Contractor</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
7.4. Increased level of road accidents (involving pedestrians, animals, other motorists on the surrounding tarred/gravel road network) due to increased traffic during construction.	<p>Minimise the impact of the construction activities on the local traffic and avoid accidents with pedestrians, animals and other drivers on the surrounding tarred/gravel roads.</p> <p>Reduce number of road accidents due to increased traffic during construction.</p>	7.4.1. Well maintained vehicles should be used together with well-trained drivers during the construction phase. Vehicle maintenance and driver competency should be monitored. Proof of driver competency as well as the vehicle checks should be verified and undertaken to ensure that vehicles are roadworthy and hence, do not pose a safety risk. The Contractors must ensure that construction vehicles are roadworthy, properly serviced and maintained, and respect the vehicle safety standards implemented by the Project Developer.	<ul style="list-style-type: none"> <li>Carry out random checks of driver licenses and conduct random visual inspections of construction vehicles for roadworthiness.</li> </ul>	<ul style="list-style-type: none"> <li>Random visual inspection of vehicles weekly.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> </ul>
		7.4.2. Road kill monitoring programme (inclusive of wildlife collisions record keeping) should be established and fences should be installed, if needed, to direct animals to safe road crossings.	<ul style="list-style-type: none"> <li>Appropriate monitoring should be undertaken and fences installed, if needed to direct animals to safe road crossings.</li> </ul>	<ul style="list-style-type: none"> <li>Weekly</li> </ul>	<ul style="list-style-type: none"> <li>Contractor and ECO</li> </ul>
		7.4.3. Adhere to all speed limits applicable to all roads used. All heavy load vehicles should maintain a speed limit of 40 km/hour in the proposed section of the Transnet Service Road.	<ul style="list-style-type: none"> <li>Ensure that speed limits are adhered to.</li> <li>Carry out random visual inspections to verify speed limits and general awareness of vehicle drivers.</li> </ul>	<ul style="list-style-type: none"> <li>Daily</li> <li>Random during the construction phase</li> </ul>	<ul style="list-style-type: none"> <li>Contractor and ECO</li> <li>ECO</li> </ul>
		7.4.4. Implement clear and visible signage and signals indicating movement of vehicles at the intersection with the Transnet Service Road to ensure safe entry and exit.	<ul style="list-style-type: none"> <li>Implement clear signalisation.</li> <li>Carry out random inspections to verify whether proper construction signage is being implemented.</li> </ul>	<ul style="list-style-type: none"> <li>On-going</li> <li>Random during the construction phase</li> </ul>	<ul style="list-style-type: none"> <li>Contractor and ECO</li> <li>ECO</li> </ul>
7.5. Accelerated degradation of road structure due to construction traffic.	Limit the deterioration of the road condition due to construction traffic.	7.5.1. Construction activities will have a higher impact than the normal road activity and therefore the main access roads to site should be inspected on a weekly basis for structural damage.	<ul style="list-style-type: none"> <li>Ensure that the main access road to site maintains current condition through photographic surveys and monitoring.</li> </ul>	<ul style="list-style-type: none"> <li>Weekly</li> </ul>	<ul style="list-style-type: none"> <li>Contractor and ECO</li> </ul>
		7.5.2. Implement management strategies for dust generation e.g. apply dust suppressant on the Transnet Service Road, exposed areas and stockpiles.	<ul style="list-style-type: none"> <li>Ensure dust management measures are in place to adequately decrease the generation of dust.</li> </ul>	<ul style="list-style-type: none"> <li>On-going</li> </ul>	<ul style="list-style-type: none"> <li>Contractor and ECO</li> </ul>
		7.5.3. It is recommended that vehicles are not	<ul style="list-style-type: none"> <li>Perform visual inspection of vehicles</li> </ul>	<ul style="list-style-type: none"> <li>Random visual</li> </ul>	<ul style="list-style-type: none"> <li>Appointed</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		overloaded during the construction phase in order to reduce impacts on the road structures, particularly the access roads leading to the site. Random visual inspection of vehicles should be undertaken in order to monitor for overloading. The inspections should also verify if the trucks are covered with appropriate material (such as tarpaulin) if and where possible.	during the construction phase.	inspection of vehicles weekly.	Contractor
		7.5.4. Make provision for the repairing of subgrade deterioration (i.e. pot holes, dust holes) that could possibly result due to loading of heavy construction vehicles on the Transnet Service Road.	<ul style="list-style-type: none"> <li>▪ Make provision for repairs required to road</li> </ul>	<ul style="list-style-type: none"> <li>▪ Agree to with Transnet</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor and ECO</li> </ul>
7.6. Impact on air quality due to dust generation, noise and exhaust emissions from construction vehicles and equipment.	Limit the release of noise, pollutants and dust emissions	7.6.1. Implement management strategies for dust generation e.g. apply dust suppressant on the Transnet Service Road, exposed areas and stockpiles.	<ul style="list-style-type: none"> <li>▪ Ensure dust management measures are in place to adequately decrease the generation of dust.</li> </ul>	<ul style="list-style-type: none"> <li>▪ On-going</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor and ECO</li> </ul>
		7.6.2. Construction vehicles must have their lights on at all times. Lights to be properly set to not blind train drivers, who may then miss an important signal, e.g. stop signal (Signal Passed at Danger (SPAD)).	<ul style="list-style-type: none"> <li>▪ Ensure lights are on and properly set.</li> </ul>	<ul style="list-style-type: none"> <li>▪ On-going</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor and ECO</li> </ul>
		7.6.3. Postpone or reduce dust-generating activities during periods with strong wind. Earthworks may need to be rescheduled or the frequency of application of dust control/suppressant increased.	<ul style="list-style-type: none"> <li>▪ Ensure dust management measures are in place to decrease the dust generated</li> </ul>	<ul style="list-style-type: none"> <li>▪ On-going</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor and ECO</li> </ul>
		7.6.4. Avoid using old and unmaintained construction equipment (which generate high sound levels) and ensure equipment is well maintained.	<ul style="list-style-type: none"> <li>▪ Manage the air pollutants form construction vehicles through checking the condition of vehicles</li> </ul>	<ul style="list-style-type: none"> <li>▪ On-going</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor and ECO</li> </ul>
<b>C. OPERATIONAL PHASE</b>					
7.7. Increased level of road accidents (involving pedestrians, animals, other motorists on the surrounding tarred/gravel road network)	Minimise the impact of the operational activities on the local traffic and avoid accidents with pedestrians, animals and other drivers on the surrounding tarred/	7.7.1. Well maintained vehicles should be used together with well-trained drivers during the operational phase, as required. Vehicle maintenance and driver competency should be monitored. Proof of driver competency as well as the vehicle checks should be verified and	<ul style="list-style-type: none"> <li>▪ Carry out random checks of driver licenses and conduct random visual inspections of vehicles for roadworthiness.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Random visual inspection of vehicles weekly.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
due to increased traffic during the operational phase.	gravel roads.  Reduce number of road accidents due to increased traffic during the operational phase.	undertaken to ensure that vehicles are roadworthy and hence, do not pose a safety risk. Vehicles must be roadworthy, properly serviced and maintained.			
		7.7.2. Adhere to all speed limits applicable to all roads used. All heavy load vehicles should maintain a speed limit of 40 km/hour in the proposed section of the Transnet Service Road.	<ul style="list-style-type: none"> <li>▪ Ensure that speed limits are adhered to.</li> <li>▪ Carry out random visual inspections to verify speed limits and general awareness of vehicle drivers.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily</li> <li>▪ Random during the operational phase</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager</li> <li>▪ Facility Manager</li> </ul>
		7.7.3. Implement clear and visible signage and signals indicating movement of vehicles at the intersection with the Transnet Service Road to ensure safe entry and exit.	<ul style="list-style-type: none"> <li>▪ Implement clear signalisation.</li> <li>▪ Carry out random inspections to verify whether proper construction signage is being implemented.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ongoing</li> <li>▪ Random during the operational phase</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager</li> <li>▪ Facility Manager</li> </ul>
		7.7.4. The use of public transport (buses and/or minibus taxis) or carpooling to convey operational personnel to the site should be encouraged.	<ul style="list-style-type: none"> <li>▪ Monitor the requirements</li> </ul>	<ul style="list-style-type: none"> <li>▪ On-going</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager</li> </ul>
		7.7.5. Adhere to requirements made within Transport Traffic Plan.	<ul style="list-style-type: none"> <li>▪ Monitor the requirements as set out in the Plan as ensure that it is adhered to</li> </ul>	<ul style="list-style-type: none"> <li>▪ On-going</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager</li> </ul>
		7.7.6. Limit access to the site to personnel.	<ul style="list-style-type: none"> <li>▪ Maintain a register of visitors and staff that enter site and restrict access to personnel.</li> </ul>	<ul style="list-style-type: none"> <li>▪ On-going</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager</li> </ul>
		7.8. Accelerated degradation of road structure due to operational traffic.	Limit the deterioration of the road condition due to operational phase traffic.	7.8.1. The main access roads to site should be inspected on a weekly basis for structural damage.	<ul style="list-style-type: none"> <li>▪ Ensure that the main access road to site maintains current condition through photographic surveys and monitoring.</li> </ul>
7.8.2. Implement management strategies for dust generation e.g. apply dust suppressant on the Transnet Service Road, exposed areas and stockpiles.	<ul style="list-style-type: none"> <li>▪ Ensure dust management measures are in place to adequately decrease the generation of dust.</li> </ul>			<ul style="list-style-type: none"> <li>▪ On-going</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager</li> </ul>
7.8.3. It is recommended that vehicles are not overloaded during the operational phase (where applicable) in order to reduce impacts on the road structures, particularly the access roads leading to the site. Random visual	<ul style="list-style-type: none"> <li>▪ Perform visual inspection of vehicles during the construction phase.</li> </ul>			<ul style="list-style-type: none"> <li>▪ Random visual inspection of vehicles weekly.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		inspection of vehicles should be undertaken in order to monitor for overloading (where applicable).			
		7.8.4. Make provision for the repairing of subgrade deterioration (i.e. pot holes, dust holes) that could possibly result due to overloading of vehicles (where applicable) on the Transnet Service Road.	<ul style="list-style-type: none"> <li>▪ Make provision for repairs required to road.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Agree to with Transnet</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar)</li> </ul>
		7.8.5. Implement requirements of the Road Maintenance Plan.	<ul style="list-style-type: none"> <li>▪ Adhere to requirements of the Road Maintenance Plan.</li> </ul>	<ul style="list-style-type: none"> <li>▪ On-going</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager</li> </ul>
<b>D. DECOMMISSIONING PHASE</b>					
7.9. Ensure that the construction mitigation and management measures are adhered to during the decommissioning phase.					

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

### 7.5. STORM WATER MANAGEMENT PLAN

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>A. DESIGN PHASE</b>					
8.1. Impact of the project if a detailed storm water management plan is not correctly prepared.	To limit the effect of uncontrolled storm water run-off from developed areas onto natural areas	8.1.1. Prepare a detailed stormwater management plan outlining appropriate treatment measures to address runoff from disturbed portions of the site, such that they do not: <ul style="list-style-type: none"> <li>▪ result in concentrated flows into natural watercourses i.e. provision should be made for temporary or permanent measures that allow for attenuation, control of velocities and capturing of sediment upstream of natural water courses;</li> <li>▪ result in any necessity for concrete or other lining of natural water courses to protect them from concentrated flows of the development;</li> <li>▪ divert flows out of their natural flow pathways, thus depriving downstream watercourses of water.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Check compliance with specified conditions.</li> <li>▪ Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once-off during design followed by regular control</li> <li>▪ During the design phase</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor</li> <li>▪ ECO</li> </ul>
<b>B. CONSTRUCTION PHASE</b>					
8.2. Diversion and impedance surface water flows - Changes to the hydrological regime and increased potential for erosion.	Prevent interference with natural run-off patterns, diverting flows and increasing the velocity of surface water flows.	8.2.1. The appointed Contractor should compile a Method Statement for Stormwater Management during the construction phase.	<ul style="list-style-type: none"> <li>▪ Compile a Method Statement for Stormwater Management during the construction phase.</li> <li>▪ Inspect and verify if a Method Statement for Stormwater Management has been compiled by the Contractor via audits prior to the commencement of the construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Prior to the construction phase.</li> <li>▪ Once-off prior to the commencement of the construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor</li> <li>▪ ECO</li> </ul>



## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
Diversion and increased velocity of surface water flows - reduction in permeable surfaces		8.2.2. Stormwater and any run-off generated by the hard surfaces should be discharged into retention swales or areas with rock rip-rap (or similar). These could be used to enhance the sense of place, if they are planted with indigenous vegetation.	<ul style="list-style-type: none"> <li>Check compliance with specified conditions of the Stormwater Management Plan and Method Statement.</li> </ul>	<ul style="list-style-type: none"> <li>Weekly or bi-weekly</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> </ul>
		8.2.3. Erosion and sedimentation into water bodies must be minimised through the effective stabilisation (gabions and Reno mattresses or similar) and the re-vegetation of any disturbed riverbanks.	<ul style="list-style-type: none"> <li>Check compliance with specified conditions of the Stormwater Management Plan and Method Statement.</li> </ul>	<ul style="list-style-type: none"> <li>Weekly or Bi-weekly</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> </ul>
		8.2.4. Place energy dissipation structures in a manner that allows the management of flows prior to being discharged into the natural environment, thus not only preventing erosion, but supporting the maintenance of natural base flows within these systems i.e. hydrological regime (water quantity and quality) is maintained.	<ul style="list-style-type: none"> <li>Check compliance with specified conditions of the Stormwater Management Plan and Method Statement.</li> </ul>	<ul style="list-style-type: none"> <li>Weekly or bi-weekly</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> </ul>
		8.2.5. Reinforce soil slopes to minimise erosion during rehabilitation (as needed, and once construction in a specific area has ceased).	<ul style="list-style-type: none"> <li>Monitor activities and record and report non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>As needed during the construction phase</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> </ul>
		8.2.6. Any irrigation of the development area for landscaping or dust control purposes should be controlled, such that it does not result in any measurable increase in moisture being passed into natural drainage lines.	<ul style="list-style-type: none"> <li>Check compliance with specified conditions of the Stormwater Management Plan and Method Statement.</li> </ul>	<ul style="list-style-type: none"> <li>Weekly or bi-weekly</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> </ul>
		8.2.7. Drainage along the sides of the roads should be designed so that it does not result in concentrated flows into watercourses.	<ul style="list-style-type: none"> <li>Check compliance with specified conditions of the Stormwater Management Plan and Method Statement.</li> </ul>	<ul style="list-style-type: none"> <li>Weekly or bi-weekly</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> </ul>
		8.2.8. Perform periodic inspections and maintenance of soil erosion measures and stormwater control structures.	<ul style="list-style-type: none"> <li>Monitor activities and record and report non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>As needed during the construction phase</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<p>8.3. Pollution of the surrounding environment as a result of the contamination of stormwater. Contamination could result from the spillage of chemicals, oils, fuels, sewage, solid waste, litter etc.</p>	<p>To prevent contaminated stormwater from entering into and adversely impacting on freshwater ecosystems and reducing the water quality.</p> <p>To reduce sedimentation of nearby water systems.</p> <p>To apply best practice principles in managing risks to storm water pollution.</p>	<p>8.3.1. The appointed Contractor should compile a Method Statement for Stormwater Management during the construction phase.</p>	<ul style="list-style-type: none"> <li>▪ Compile a Method Statement for Stormwater Management during the construction phase.</li> <li>▪ Inspect and verify if a Method Statement for Stormwater Management has been compiled by the Contractor via audits prior to the commencement of the construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Prior to the construction phase.</li> <li>▪ Once-off prior to the commencement of the construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor</li> <li>▪ ECO</li> </ul>
		<p>8.3.2. Provide secure storage for fuel, oil, chemicals and other waste materials to prevent contamination of stormwater runoff. Fuels and chemicals (i.e. any hazardous materials and dangerous goods) used during the construction phase must be stored safely on site and in bunded areas. Fuel and chemical storage containers must be inspected to ensure that any leaks are detected early.</p>	<ul style="list-style-type: none"> <li>▪ Monitor the storage and handling of dangerous goods and hazardous materials on site via site audits and record non-compliance and incidents. Monitor if spillages have taken place and if they are removed correctly.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> </ul>
		<p>8.3.3. All stockpiles must be protected from erosion and stored on flat areas where run-off will be minimised. Erosion and sedimentation into water bodies must be minimised through effective stabilisation. No stockpiling should take place within a watercourse.</p>	<ul style="list-style-type: none"> <li>▪ Monitor the excavations and stockpiling process throughout the construction phase via visual site inspections. Record non-compliance and incidents.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> </ul>
		<p>8.3.4. Stockpiles must be located away from river channels i.e. greater than 32 m.</p>			
		<p>8.3.5. Littering and contamination of water resources during construction must be prevented by effective construction camp management.</p>	<ul style="list-style-type: none"> <li>▪ Monitor via site audits and record non-compliance and incidents (i.e. by implementing walk through inspections).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor and ECO</li> </ul>
		<p>8.3.6. Emergency plans must be in place to deal with potential spillages (especially those leading to any watercourses).</p>	<ul style="list-style-type: none"> <li>▪ Check compliance with specified conditions of the Stormwater Management Plan and Method Statement.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Weekly or Bi-weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> </ul>
		<p>8.3.7. Erosion and sedimentation into water bodies must be minimised through the effective stabilisation (gabions and Reno mattresses or</p>	<ul style="list-style-type: none"> <li>▪ Check compliance with specified conditions of the Stormwater Management Plan and Method</li> </ul>	<ul style="list-style-type: none"> <li>▪ Weekly or Bi-weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		similar) and the re-vegetation of any disturbed riverbanks.	Statement.		
		8.3.8. Ensure that the temporary site camp and ablution facilities are established at least 32 m away from the banks of the major drainage lines.	<ul style="list-style-type: none"> <li>▪ Monitor the placement of the site camp via visual inspections, and record and report any non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once-off prior to construction and as required during the construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> </ul>
		8.3.9. Ensure that there is no ad-hoc crossing of channels by vehicles during the construction phase. Access routes across the site should be strictly demarcated and selected with a view to minimise impacts on drainage lines.	<ul style="list-style-type: none"> <li>▪ Check compliance with specified conditions of the Stormwater Management Plan and Method Statement.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Weekly or Bi-weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> </ul>
		8.3.10. Ensure that no waste materials or sediments are left in the surrounding drainage lines (as a result of the construction).	<ul style="list-style-type: none"> <li>▪ Check compliance with specified conditions of the Stormwater Management Plan and Method Statement.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Weekly or Bi-weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> </ul>
		8.3.11. Regular inspections of stormwater infrastructure should be undertaken to ensure that it is kept clear of all debris and weeds.	<ul style="list-style-type: none"> <li>▪ Monitor via site audits and record non-compliance and incidents (i.e. by implementing walk through inspections).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor and ECO</li> </ul>
<b>C. OPERATIONAL PHASE</b>					
8.4. Stormwater discharge into the surrounding environment during operations	To minimise the contamination of stormwater by uncontrolled release of contaminated or grey water.	8.4.1. An operational phase Stormwater Management Plan should be designed and implemented, with a view to prevent the passage of concentrated flows from hardened surfaces and onto natural areas.	<ul style="list-style-type: none"> <li>▪ Compile a Stormwater Management Plan for the operational phase.</li> <li>▪ Inspect and verify if a Stormwater Management Plan has been compiled prior to the commencement of the operational phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Continuously during operational phase.</li> <li>▪ Once-off prior to the commencement of the operational phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar)</li> </ul>
	To protect soil resources and prevent soil erosion.	8.4.2. All release points into the natural environment must have appropriate energy dissipaters to minimise scouring/erosion.	<ul style="list-style-type: none"> <li>▪ Monitor activities and record and report non-compliance.</li> <li>▪ Monitor the placement of energy dissipaters via visual inspections, and record and report any non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>▪ On-going</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar)</li> </ul>
		8.4.3. As far as reasonably possible, separate “clean” and “dirty” storm water. As far as reasonably possible, capture and contain “dirty” stormwater for appropriate	<ul style="list-style-type: none"> <li>▪ Monitor via site audits and record non-compliance and incidents (i.e. by implementing inspections).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Weekly or as required during operations.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar)</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		disposal/discharge.			
		8.4.4. Regular inspections of stormwater infrastructure should be undertaken to ensure that it is kept clear of all debris and weeds.	<ul style="list-style-type: none"> <li>▪ Undertake regular inspections of the stormwater infrastructure (i.e. by implementing walk through inspections).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Weekly/Monthly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar)</li> </ul>
<b>D. DECOMMISSIONING PHASE</b>					
<p>8.5. The proposed solar facility would be expected to run for a minimum period of 20 years, after which it would either be decommissioned, alternatively upgraded or an application submitted to obtain a new license. Should the plant be decommissioned, the solar field would be rehabilitated to its original (pre-development) state. In the (unlikely) event that none of the mitigation measures outlined for the construction and operational phases of the proposed project had been implemented, the period of time for recovery to take place would be extended. In the event that decommissioning occurs, and assuming implementation of mitigation measures, the hydrological regime should fully recover over time to present day conditions.</p>					

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

### 7.6. EROSION MANAGEMENT PLAN

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>A. CONSTRUCTION PHASE</b>					
9.1. Increased wind erosion and resultant deposition of dust	Prevent wind erosion and resultant deposition of dust on surrounding indigenous vegetation.	9.1.1. Sand, stone and cement should be stored in demarcated areas, and covered or sealed to prevent wind erosion and resultant deposition of dust on the surrounding indigenous vegetation.	<ul style="list-style-type: none"> <li>Undertake regular inspections of the via site audits to verify that sand, stone and cement are stored and handled as instructed.</li> </ul>	<ul style="list-style-type: none"> <li>Daily</li> </ul>	<ul style="list-style-type: none"> <li>ECO and Contractor</li> </ul>
		9.1.2. During construction, efforts should be made to retain as much natural vegetation as possible on the site, to reduce disturbed areas and maintain plant cover, thus reducing erosion risks.	<ul style="list-style-type: none"> <li>Monitor activities via site inspections and record and report non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>Daily</li> </ul>	<ul style="list-style-type: none"> <li>ECO and Contractor</li> </ul>
		9.1.3. All stockpiles must be protected from erosion and stored on flat areas where run-off will be minimised. Erosion and sedimentation into water bodies must be minimised through effective stabilisation.	<ul style="list-style-type: none"> <li>Monitor the stockpiling process throughout the construction phase via visual site inspections. Record non-compliance and incidents.</li> </ul>	<ul style="list-style-type: none"> <li>Daily</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> </ul>
9.2. Excessive loss of natural vegetation within the development footprint area	Prevent loss of natural vegetation through erosion.	9.2.1. Vegetation clearing during construction must be restricted to the footprint of the proposed project components and planned infrastructure only. It should be phased to ensure that the minimum area of soil is exposed to potential erosion at any one time.	<ul style="list-style-type: none"> <li>Monitor vegetation clearing throughout the construction phase via visual site inspections. Record non-compliance and incidents.</li> <li>Undertake regular monitoring for erosion to ensure is reduced and rectified as soon as possible.</li> </ul>	<ul style="list-style-type: none"> <li>Daily</li> <li>Daily</li> </ul>	<ul style="list-style-type: none"> <li>ECO and Contractor</li> <li>ECO</li> </ul>
		9.2.2. Stockpile the shallow topsoil layer separately from the subsoil layers (especially if the excavation exceeds 0.5 m). Reinstatement the topsoil layers (containing seed and vegetative material) when construction is complete to allow the plants to rapidly re-colonise the bare soil areas.	<ul style="list-style-type: none"> <li>Rehabilitate disturbed areas and monitor the presence of alien invasive species on site.</li> </ul>	<ul style="list-style-type: none"> <li>Daily (stockpiling) and once-off for the reinstatement of the top soil layer</li> </ul>	<ul style="list-style-type: none"> <li>ECO and Contractor</li> </ul>
		9.2.3. Re-seed with locally-sourced seed of indigenous grass species that were recorded on site pre-construction.	<ul style="list-style-type: none"> <li>Re-seed with seeds of indigenous grass species.</li> </ul>	<ul style="list-style-type: none"> <li>Once off</li> </ul>	<ul style="list-style-type: none"> <li>ECO with advice from specialist (if</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
					required)
		9.2.4. Topsoil stockpiles not used in three months after stripping must be seeded to prevent dust and erosion.	<ul style="list-style-type: none"> <li>Regular monitoring for erosion to ensure that no erosion problems are occurring at the site. All erosion problems observed should be rectified as soon as possible.</li> </ul>	<ul style="list-style-type: none"> <li>Weekly initially and thereafter monthly</li> </ul>	<ul style="list-style-type: none"> <li>ECO and Contractor</li> </ul>
9.3. Erosion of surface soils, rilling and gulleys.	Measures to be implemented that address or avoid the loss of surface soils and exacerbates gully formation.	9.3.1. Identify cause of erosion and possible means of redress (i.e. implement erosion control measures, where applicable), such as the use of geofabric, stone gabions and re-vegetation or similar measures.  9.3.2. Erosion control measures should seek to reduce surface flow velocity and allow for settlement on site of silt laden surface waters. Washaways, excessive loss of soils and gulleys can be considered to be indicative of excessive erosion.	<ul style="list-style-type: none"> <li>Monitor the erosion on site during construction, as well as the implementation and effectiveness of erosion control on site (such as the use of geofabric, stone gabions and re-vegetation or similar measures).</li> </ul>	<ul style="list-style-type: none"> <li>Ongoing and as required during erosion events.</li> </ul>	<ul style="list-style-type: none"> <li>ECO and Project Developer (Scatec Solar)</li> </ul>
<b>B. OPERATIONAL PHASE</b>					
9.4. Excessive loss of natural vegetation in the development footprint area and resulting impacts on SSC, faunal habitat and habitat fragmentation.	Prevent loss of natural vegetation and minimise habitat fragmentation and the loss of connectivity as a result of erosion.	9.4.1. To prevent erosion, indigenous grasses that seed themselves below the solar arrays should (where possible) be left to form a ground cover and kept short.	<ul style="list-style-type: none"> <li>ECO to advise on seed to be used.</li> </ul>	<ul style="list-style-type: none"> <li>Prior to re-vegetation.</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> </ul>
		9.4.2. The use of silt fences, sand bags or other suitable methods must be implemented in areas that are susceptible to erosion. Other erosion control measures that can be implemented are as follows: 1) Brush packing with cleared vegetation, 2) Planting of vegetation, 3) Hydro seeding/hand sowing. All erosion control mechanisms need to be regularly maintained.	<ul style="list-style-type: none"> <li>Monitor efficiency of erosion control measures.</li> </ul>	<ul style="list-style-type: none"> <li>Weekly or monthly</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		9.4.3. Conduct regular monitoring for erosion to ensure that no erosion problems are occurring at the site as a result of the roads and other infrastructure. Ensure that all erosion problems are rectified as soon as possible.	<ul style="list-style-type: none"> <li>Undertake regular monitoring for erosion to ensure is reduced and rectified as soon as possible.</li> </ul>	<ul style="list-style-type: none"> <li>Monthly</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> </ul>
9.5. Increased wind erosion and resultant deposition of dust.	Prevent wind erosion and resultant deposition of dust on surrounding indigenous vegetation.	9.5.1. Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion.	<ul style="list-style-type: none"> <li>Include periodic site inspections in environmental performance reporting that inspects the effectiveness and integrity of the run-off control system and specifically records occurrence or non-occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.</li> </ul>	<ul style="list-style-type: none"> <li>Monthly</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> </ul>
<b>C. DECOMMISSIONING PHASE</b>					
9.6. No specific impacts are associated with the decommissioning phase other than those from the operational phase that will still be relevant for the duration of the decommissioning phase due to on-going occupation of the area. Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas. Monitoring: Final external audit of area to confirm that area is rehabilitated to an acceptable level (once off event to be conducted by ECO).					

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

### 7.7. HAZARDOUS SUBSTANCES LEAKAGE OR SPILLAGE MONITORING SYSTEM

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>A. CONSTRUCTION PHASE</b>					
10.1. Contamination of soil and risk of damage to vegetation and/or fauna through spillage of concrete and cement.	To control concrete and cement batching activities in order to reduce spillages and resulting contamination of soil, groundwater and the vegetation and/or fauna.	10.1.1. If any concrete mixing takes place on site, this must be carried out in a clearly marked, designated area at the site camp on an impermeable surface (such as on boards or plastic sheeting and/or within a bunded area with an impermeable surface).	<ul style="list-style-type: none"> <li>Monitor the handling and storage of sand, stone and cement as instructed.</li> </ul>	<ul style="list-style-type: none"> <li>Daily</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar), Contractor and ECO</li> </ul>
		10.1.2. Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains.	<ul style="list-style-type: none"> <li>Monitor the handling and storage of sand, stone and cement as instructed.</li> </ul>	<ul style="list-style-type: none"> <li>Daily</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar), Contractor and ECO</li> </ul>
		10.1.3. A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted.	<ul style="list-style-type: none"> <li>Monitor the handling and storage of sand, stone and cement as instructed.</li> </ul>	<ul style="list-style-type: none"> <li>Daily</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar), Contractor and ECO</li> </ul>
		10.1.4. Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licenced disposal facility. Proof of disposal (i.e. waste disposal slips or waybills) should be retained on file for auditing purposes.	<ul style="list-style-type: none"> <li>Monitor the handling and storage of sand, stone and cement as instructed.</li> <li>Monitor waste disposal slips and waybills via site audits and record non-compliance and incidents.</li> </ul>	<ul style="list-style-type: none"> <li>Daily</li> <li>Monthly</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar), Contractor and ECO</li> <li>ECO</li> </ul>
		10.1.5. Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site. Empty cement bags must be collected from the construction area at the end of every day. Sand and aggregates containing cement must be kept damp to prevent the generation of dust.	<ul style="list-style-type: none"> <li>Monitor the handling and storage of sand, stone and cement as instructed.</li> </ul>	<ul style="list-style-type: none"> <li>Daily</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar), Contractor and ECO</li> </ul>
		10.1.6. Any excess sand, stone and cement must be removed from site at the completion of the construction period and disposed at a licenced waste disposal facility. Proof of disposal (i.e. waste disposal slips or waybills) should be retained on file for auditing purposes.	<ul style="list-style-type: none"> <li>Monitor the handling and storage of sand, stone and cement as instructed.</li> <li>Monitor waste disposal slips and waybills via site audits and record non-compliance</li> </ul>	<ul style="list-style-type: none"> <li>Daily</li> <li>Monthly</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar), Contractor and ECO</li> <li>ECO</li> </ul>



## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
			and incidents.		
10.2. Contamination of soil and risk of damage to vegetation and/or fauna through spillage of fuels and oils.	To control and eliminate fuel and oil spillages which may result in soil contamination and damage to vegetation and/or fauna.	10.2.1. Ensure that adequate containment structures are provided for the temporary storage of liquid dangerous goods and hazardous materials on site (such as chemicals, oil, fuel, hydraulic fluids, lubricating oils etc.). Appropriate bund areas must be provided for the storage of these materials at the site camp. Bund areas should contain an impervious surface in order to prevent spillages from entering the ground. Bund areas should have a capacity of 110 % of the volume of the largest tank in the bund (tanks include storage of fuel/diesel).	<ul style="list-style-type: none"> <li>Monitor the storage and handling of dangerous goods and hazardous materials on site via site audits and record non-compliance and incidents.</li> </ul>	Weekly	Contractor and ECO
		10.2.2. Monitor and inspect construction equipment and vehicles to ensure that no fuel spillage takes place. Ensure that drip trays are provided for construction equipment and vehicles as required.	<ul style="list-style-type: none"> <li>Monitor the construction equipment and vehicles and monitor the occurrence of spills and the management process thereof.</li> <li>Record all spills and lessons learnt.</li> </ul>	<ul style="list-style-type: none"> <li>Daily</li> <li>During spill events</li> </ul>	Contractor and ECO ECO
		10.2.3. Contractor to compile a Method Statement for refuelling activities under normal and emergency situations. If on-site servicing and refuelling is required in emergency situations, a designated area must be created at the construction site camp for this purpose. Drip trays or similar impervious materials must be used during these procedures.	<ul style="list-style-type: none"> <li>Verify if a Method Statement is compiled by reviewing approved and signed off reports.</li> <li>Monitor the refuelling/ servicing process and record the occurrence of any spillages.</li> </ul>	<ul style="list-style-type: none"> <li>Once-off prior to commencement of construction.</li> <li>During emergency refuelling and servicing activities.</li> </ul>	ECO ECO
		10.2.4. Spilled fuel, oil or grease must be retrieved and contaminated soil removed, cleaned and replaced.	<ul style="list-style-type: none"> <li>Monitor the handling and storage of fuels and oils via site audits and monitor if spillages have taken place and if so, are removed correctly. Monitor waste disposal slips and waybills via site audits and record non-compliance and</li> </ul>	Daily (or during spills)	Contractor and ECO

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
			incidents.		
		10.2.5. Contaminated soil to be collected by the Contractor (under observation of the ECO) and disposed of at a registered waste facility designated for this purpose. Proof of disposal (i.e. waste disposal slips or waybills) should be retained on file for auditing purposes.	<ul style="list-style-type: none"> <li>▪ Monitor the correct removal of contaminated soil. Monitor waste disposal slips and waybills via site audits and record non-compliance and incidents.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily (or during spills)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor and ECO</li> </ul>
		10.2.6. A Spill Response Method Statement must be compiled by the Contractor for the construction phase in order to manage potential spill events.	<ul style="list-style-type: none"> <li>▪ Compile a Spill Response Method Statement.</li> <li>▪ Audit signed and approved Spill Response Method Statement.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once-off (and thereafter updated as required during the construction phase).</li> <li>▪ Once-off (and thereafter as required during the construction phase).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor and Project Developer (Scatec Solar)</li> <li>▪ ECO</li> </ul>
		10.2.7. The Contractor must ensure that adequate spill containment and clean-up equipment are provided on site for use during spill events.	<ul style="list-style-type: none"> <li>▪ Monitor via site audits and record incidents and non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily/Weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO and Contractor</li> </ul>
		10.2.8. Portable bioremediation kit (to remedy chemical spills) is to be held on site and used as required.	<ul style="list-style-type: none"> <li>▪ Ensure that a well-maintained portable bioremediation kit is available on site and that construction personnel and contractors are aware of its location and instructions</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor and ECO</li> </ul>
		10.2.9. In case of a spillage of hazardous chemicals where contamination of soil occurs, depending on the degree and level of contamination, excavation and removal to a hazardous waste disposal facility could be necessary. If the spillage is widespread and the soil is considered to be significantly contaminated, a specialist will need to be immediately appointed to address the spillage. This will usually entail the collection of samples of the contaminated soil followed by analysis in terms of the 2014 National	<ul style="list-style-type: none"> <li>▪ Ensure that a suitably qualified specialist is appointed to collect and analyse the contaminated soil samples in terms of the 2014 Norms and Standards (i.e. GN 331) in order to determine if the soil is significantly contaminated or not.</li> </ul>	<ul style="list-style-type: none"> <li>▪ During spill events</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar)</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<p>Norms and Standards for the Remediation of Contaminated Land and Soil Quality (i.e. GN 331). If the soil is determined to be significantly contaminated, then compliance with Part 8 of the NEMWA should be achieved by the Applicant, including notifying the Minister of Environmental Affairs of the significant contamination.</p>	<ul style="list-style-type: none"> <li>If the contaminated soil is considered to be significantly contaminated, then compliance with Part 8 of the NEMWA should be achieved by the Applicant.</li> </ul>		
		10.2.10. The Contractor must record and document all significant spill events.	<ul style="list-style-type: none"> <li>Monitor documentation and records of significant spill events via audits and record non-compliance and incidents.</li> </ul>	<ul style="list-style-type: none"> <li>During spill events</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> </ul>
<b>B. OPERATIONAL PHASE</b>					
10.3. Contamination of soil and risk of damage to vegetation and/or fauna through spillage of fuels and oils	To control and eliminate fuel and oil spillages which may result in soil contamination and damage to vegetation and/or fauna.	10.3.1. Monitor and inspect maintenance equipment and vehicles to ensure that no fuel spillage takes place.	<ul style="list-style-type: none"> <li>Implement specifications for maintenance equipment use as specified by the maintenance Contractor.</li> </ul>	<ul style="list-style-type: none"> <li>Monthly</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> </ul>
		10.3.2. Spilled fuel, oil or grease is retrieved during operations where possible and contaminated soil removed, cleaned and replaced.	<ul style="list-style-type: none"> <li>Monitor the handling and storage of fuels and oils via site audits and monitor if spillages have taken place and if so, are removed correctly. Monitor waste disposal slips and waybills via site audits and record non-compliance and incidents.</li> </ul>	<ul style="list-style-type: none"> <li>During spills</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> </ul>
		10.3.3. Contaminated soil to be collected by the Contractor and disposed of at a registered waste facility designated for this purpose. Proof of disposal (i.e. waste disposal slips or waybills) should be retained on file for auditing purposes.	<ul style="list-style-type: none"> <li>Monitor the correct removal of contaminated soil. Monitor waste disposal slips and waybills via site audits and record non-compliance and incidents.</li> </ul>	<ul style="list-style-type: none"> <li>During spills</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<p>10.3.4. A Spill Response Plan must be compiled for the operational phase in order to manage potential spill events.</p>	<ul style="list-style-type: none"> <li>▪ Compile a Spill Response Plan.</li> <li>▪ Audit signed and approved Spill Response Method Statement.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once-off (and thereafter updated as required).</li> <li>▪ Once-off (and thereafter as required).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar)</li> <li>▪ Facility Manager</li> </ul>
		<p>10.3.5. Ensure that adequate spill containment and clean-up equipment are provided on site for use during spill events. Portable bioremediation kit (to remedy chemical spills) is to be held on site and used as required.</p>	<ul style="list-style-type: none"> <li>▪ Ensure that a well-maintained portable bioremediation kit is available on site and that operational personnel are aware of its location and instructions.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager</li> </ul>
		<p>10.3.6. In case of a spillage of hazardous chemicals where contamination of soil occurs, depending on the degree and level of contamination, excavation and removal to a hazardous waste disposal facility could be necessary. If the spillage is widespread and the soil is considered to be significantly contaminated, a specialist will need to be immediately appointed to address the spillage. This will usually entail the collection of samples of the contaminated soil followed by analysis in terms of the 2014 National Norms and Standards for the Remediation of Contaminated Land and Soil Quality (i.e. GN 331). If the soil is determined to be significantly contaminated, then compliance with Part 8 of the NEMWA should be achieved by the Applicant, including notifying the Minister of Environmental Affairs of the significant contamination.</p>	<ul style="list-style-type: none"> <li>▪ Ensure that a suitably qualified specialist is appointed to collect and analyse the contaminated soil samples in terms of the 2014 Norms and Standards (i.e. GN 331) in order to determine if the soil is significantly contaminated or not.</li> <li>▪ If the contaminated soil is considered to be significantly contaminated, then compliance with Part 8 of the NEMWA should be achieved by the Applicant.</li> </ul>	<ul style="list-style-type: none"> <li>▪ During spill events</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar)</li> </ul>
		<p>10.3.7. Ensure that adequate containment structures are provided for the temporary storage of liquid dangerous goods and hazardous materials on site (such as chemicals, oil, fuel, hydraulic fluids, lubricating oils etc.). Appropriate bund areas must be provided for the storage of these materials at the PV facility. Bund areas should contain an impervious surface in order to prevent spillages from entering the ground. Bund areas should have a capacity of 110 % of the volume of the largest tank in the bund</p>	<ul style="list-style-type: none"> <li>▪ Monitor the storage and handling of dangerous goods and hazardous materials on site via site audits and record non-compliance and incidents.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		(tanks include storage of fuel/diesel).			
10.4.Impacts due to management solid and liquid wastes disposed of on the site during operational phase.	Prevent environmental impacts as a result of the operational phase such as pollution.	10.4.1. All operation waste to be removed from the site by an appointed service provider.	<ul style="list-style-type: none"> <li>▪ Waste removal and disposal to be monitored throughout operation.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monthly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager</li> </ul>
		10.4.2. All liquid waste or spills (used oil, paints, lubricating compounds and grease from vehicles passing through the entrance facility) to be packaged and disposed appropriately at a registered landfill site.	<ul style="list-style-type: none"> <li>▪ Monitor the correct removal of liquid waste or spills. Monitor waste disposal slips and waybills via site audits and record non-compliance and incidents.</li> </ul>	<ul style="list-style-type: none"> <li>▪ During spills</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar)</li> </ul>
		10.4.3. Adequate containers for the cleaning of equipment and materials (paint, solvent) must be provided in order to avoid spillages.	<ul style="list-style-type: none"> <li>▪ Monitor the storage and handling of dangerous goods and hazardous materials on site via site audits and record non-compliance and incidents.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager</li> </ul>
<b>C. DECOMMISSIONING PHASE</b>					
10.5.No specific impacts are associated with the decommissioning phase other than those from the operational phase that will still be relevant for the duration of the decommissioning phase due to on-going occupation of the area.					

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

### 7.8. ENVIRONMENTAL AWARENESS AND FIRE MANAGEMENT PLAN

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>A. DESIGN PHASE</b>					
11.1.Potential impacts resulting from the lack of overall compliance with the conditions of the EA (issued by the DEA)	Ensure compliance with all environmental conditions of approval (issued by DEA as part of the EA).	11.1.1. Audit the implementation of the EMPr requirements.	<ul style="list-style-type: none"> <li>Audit report on compliance with actions and monitoring requirements.</li> </ul>	<ul style="list-style-type: none"> <li>Weekly</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> </ul>
		11.1.2. Establish clear and transparent reporting of the activities undertaken with regard to all recommendations included in the EMPr.	<ul style="list-style-type: none"> <li>Audit report on compliance with actions and monitoring requirements.</li> </ul>	<ul style="list-style-type: none"> <li>Weekly</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> </ul>
<b>B. CONSTRUCTION PHASE</b>					
11.2.Potential risk of fire due to construction activities or behaviour of staff on site during the construction phase	Prevent fire on site resulting of workers smoking or starting fires (i.e. cooking, heating purposes).	11.2.1. Designate smoking areas, as well as areas for cooking, where the fire hazard could be regarded as insignificant.	<ul style="list-style-type: none"> <li>Ad-hoc checks to ensure workers are smoking or cooking in designated areas only.</li> </ul>	<ul style="list-style-type: none"> <li>Daily</li> </ul>	<ul style="list-style-type: none"> <li>ECO and Contractor</li> </ul>
		11.2.2. Educate workers on the dangers of open and/or unattended fires.	<ul style="list-style-type: none"> <li>Ensure fire safety requirements are well understood and respected by construction personnel.</li> <li>Carry out Environmental Awareness Training.</li> <li>Conduct audits of the signed attendance registers.</li> </ul>	<ul style="list-style-type: none"> <li>Ongoing.</li> <li>Once-off training and ensure that all new staff are inducted.</li> <li>Monthly</li> </ul>	<ul style="list-style-type: none"> <li>ECO and Contractor</li> <li>Contractor/ ECO</li> <li>ECO</li> </ul>
		11.2.3. Open fires must be prohibited. Appropriate fire safety training should also be provided to staff that are to be on the site for the duration of the construction phase.	<ul style="list-style-type: none"> <li>Ensure fire safety requirements are well understood and respected by construction personnel. Provide basic fire safety training.</li> </ul>	<ul style="list-style-type: none"> <li>On-going</li> </ul>	<ul style="list-style-type: none"> <li>ECO and Contractor</li> </ul>
		11.2.4. Ensure that cooking takes place in a designated area shown on the site map. Ensure that no firewood or kindling may be gathered from the site or surrounds.	<ul style="list-style-type: none"> <li>Check compliance with specified conditions using a report card, and allocate fines when necessary.</li> </ul>	<ul style="list-style-type: none"> <li>On-going</li> </ul>	<ul style="list-style-type: none"> <li>ECO and Contractors</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		11.2.5. Fire-fighting equipment must be made available at various appropriate locations on the construction site.	<ul style="list-style-type: none"> <li>▪ Ensure fire safety requirements are well understood and respected by workers.</li> <li>▪ Assurance of functionality of fire extinguishers via inspections and certification by an accredited fire service company.</li> </ul>	<ul style="list-style-type: none"> <li>▪ On-going</li> <li>▪ Bi-annually</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO and Contractor</li> <li>▪ Contractor</li> </ul>
11.3. Inappropriate behaviour of civil contractors and sub-contractors during the construction phase	<p>Prevent unnecessary impacts on the surrounding environment by ensuring that contractors are aware of the requirements of the EMPr.</p> <p>Ensure that contractors and sub-contractors do not induce impacts on the surrounding environment as a result of unplanned pollution on site.</p> <p>Ensure that actions by on-site contractors and sub-contractors and workers are properly managed in order to minimise impacts to surrounding environment.</p>	11.3.1. Ensure that the EMPr and the EA (should it be granted by the DEA), are included in all tender documentation and contractors and sub-contractors contracts.	<ul style="list-style-type: none"> <li>▪ Check compliance with specified conditions using a report card, and allocate fines when necessary.</li> </ul>	<ul style="list-style-type: none"> <li>▪ On-going</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO and Contractors</li> </ul>
		11.3.2. Contractors and sub-contractors must use the ablution facilities situated in a designated area within the site; and no bathing/washing should be permitted outside the designated area.	<ul style="list-style-type: none"> <li>▪ Check compliance with specified conditions using a report card, and allocate fines when necessary.</li> </ul>	<ul style="list-style-type: none"> <li>▪ On-going</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO and Contractors</li> </ul>
		11.3.3. All litter will be deposited in a clearly labelled, closed, animal-proof disposal bin in the construction area; particular attention needs to be paid to food waste.	<ul style="list-style-type: none"> <li>▪ Check compliance with specified conditions using a report card, and allocate fines when necessary.</li> </ul>	<ul style="list-style-type: none"> <li>▪ On-going</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO and Contractors</li> </ul>
		11.3.4. No person other than a qualified specialist or personnel authorised by the Project Developer, will disturb or remove plants outside the demarcated construction area.	<ul style="list-style-type: none"> <li>▪ Check compliance with specified conditions using a report card, and allocate fines when necessary.</li> </ul>	<ul style="list-style-type: none"> <li>▪ On-going</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO and Contractors</li> </ul>
		11.3.5. No person other than a qualified specialist or personnel authorised by the Project Developer, will disturb animals on the site.	<ul style="list-style-type: none"> <li>▪ Check compliance with specified conditions using a report card, and allocate fines when necessary.</li> </ul>	<ul style="list-style-type: none"> <li>▪ On-going</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO and Contractors</li> </ul>
		11.3.6. Educate workers on site about suitable behaviour on site and initiate environmental awareness. Staff must be informed that no trapping, snaring or feeding of any animal will be allowed.	<ul style="list-style-type: none"> <li>▪ Carry out Environmental Awareness Training.</li> <li>▪ Conduct audits of the signed attendance registers.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once-off training and ensure that all new staff are inducted.</li> <li>▪ Monthly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor/ ECO</li> <li>▪ ECO</li> </ul>
		11.4. Inappropriate planning and of site camp establishment.	Ensure that environmental issues are taken into consideration in the planning for site establishment.	11.4.1. All construction activities, materials, equipment and personnel must be restricted to the actual construction area specified (as required to undertake the construction work). The construction area must be	<ul style="list-style-type: none"> <li>▪ Monitor compliance and record non-compliance and incidents.</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		demarcated by the Contractor.			
		11.4.2. The Contractor should install and maintain Construction Site Information Boards in the position, quantity, design and dimensions specified by the Project Developer.	<ul style="list-style-type: none"> <li>▪ Monitor compliance and record non-compliance and incidents.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Before construction</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> </ul>
		11.4.3. General building materials should be stored in appropriate designated areas on site such that there will be no runoff from these areas towards sensitive systems. The site camp must be removed after construction.	<ul style="list-style-type: none"> <li>▪ Monitor compliance and record non-compliance and incidents.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Before construction</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> </ul>
11.5. Increased animal road mortality	Reduction in animal mortality	11.5.1. The construction staff should be made aware of the presence of fauna and within the proposed project area. The construction personnel and staff must also be made aware of the general speed limits on site and must be alert at all times for potential crossings, and should be trained on how to react in these situations.	<ul style="list-style-type: none"> <li>▪ Carry out Environmental Awareness Training.</li> <li>▪ Conduct audits of the signed attendance registers.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once-off training and ensure that all new staff are inducted.</li> <li>▪ Monthly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor/ ECO</li> <li>▪ ECO</li> </ul>
		11.5.2. To ensure that animals are not attracted to the site (and potentially resulting in increased road mortality), the waste collection bins and skips should be covered with suitable material, where appropriate, and the site camp must be kept clean on a daily basis.	<ul style="list-style-type: none"> <li>▪ Monitor the activities via visual inspections, and record and report any non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor and ECO</li> </ul>
		11.5.3. Establish a monitoring programme to record the number of faunal road mortalities and collisions. If it is established that the number of collisions and faunal fatalities increase within an area, particularly with regards to smaller species (reptiles), then measures such as exclusion fences within these areas only should be installed.	<ul style="list-style-type: none"> <li>▪ Appropriate monitoring and recording should be undertaken.</li> <li>▪ Exclusion fences should be installed, if needed to direct animals to safe road crossings.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Weekly</li> <li>▪ As required</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> <li>▪ ECO and Contractor</li> </ul>
11.6. Increased energy consumption during the	Reduce energy consumption where possible.	11.6.1. Encourage the use of energy saving equipment at the site camp site (such as low voltage lights and low pressure taps) and	<ul style="list-style-type: none"> <li>▪ Contractor to monitor energy usage via audits.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monthly</li> <li>▪ Once-off training and</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor</li> <li>▪ Contractor/</li> </ul>



## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
construction phase.		promote recycling. Construction personnel must be made aware of energy conservation practices as part of the Environmental Awareness Training programme.	<ul style="list-style-type: none"> <li>▪ Carry out Environmental Awareness Training.</li> <li>▪ Conduct audits of the signed attendance registers.</li> </ul>	<ul style="list-style-type: none"> <li>▪ ensure that all new staff are inducted.</li> <li>▪ Monthly</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> <li>▪ ECO</li> </ul>
11.7.Impact on the regional water balance as a result of increased water usage.	Reduce water usage during the construction phase.	11.7.1. Water conservation should be practiced as follows: <ul style="list-style-type: none"> <li>▪ Cleaning methods utilised for cleaning vehicles, floors, etc. should aim to minimise water use (e.g. sweep before wash-down).</li> <li>▪ Ensure that regular audits of water systems are conducted to identify possible water leakages.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monitor via site audits and record non-compliance and incidents.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monthly</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> </ul>
		11.7.2. Avoid the use of potable water for dust suppression during the construction phase and consider the use of alternative approved sources, where possible.			
		11.7.3. Make construction personnel aware of the importance of limiting water wastage, as well as reducing water use.	<ul style="list-style-type: none"> <li>▪ Carry out Environmental Awareness Training with a discussion on water usage and conservation.</li> <li>▪ Conduct audits of the signed attendance registers.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once-off training and ensure that all new staff are inducted.</li> <li>▪ Monthly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor/ ECO</li> <li>▪ ECO</li> </ul>
<b>C. OPERATIONAL PHASE</b>					
11.8.Potential risk of fire due to behaviour of staff on site during the operational phase	Ensure appropriate and efficient fire prevention during the operational phase.	11.8.1. Designate smoking areas as well as areas for cooking, where the fire hazard could be regarded as insignificant.	<ul style="list-style-type: none"> <li>▪ Random inspections during a month to ensure workers are smoking or starting fires in designated areas only.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monthly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager</li> </ul>
		11.8.2. Educate workers on the dangers of open and/or unattended fires.	<ul style="list-style-type: none"> <li>▪ Ensure fire safety requirements are well understood and respected by operational personnel.</li> <li>▪ Carry out Environmental Awareness Training.</li> <li>▪ Conduct audits of the signed attendance registers.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ongoing</li> <li>▪ Once-off training and ensure that all new staff are inducted.</li> <li>▪ Monthly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager</li> <li>▪ Facility Manager</li> <li>▪ Facility Manager</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<p>11.8.3. Open fires must be prohibited. Appropriate fire safety training should also be provided to staff that are to be on the site for the duration of the operational phase.</p>	<ul style="list-style-type: none"> <li>▪ Ensure fire safety requirements are well understood and respected by operational personnel. Provide basic fire safety training.</li> </ul>	<ul style="list-style-type: none"> <li>▪ On-going</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar)</li> </ul>
		<p>11.8.4. Ensure that adequate fire-fighting equipment is available and easily accessible on site.</p>	<ul style="list-style-type: none"> <li>▪ Ensure fire safety requirements are well understood and respected by workers.</li> <li>▪ Assurance of functionality of fire extinguishers via inspections and certification by an accredited fire service company.</li> </ul>	<ul style="list-style-type: none"> <li>▪ On-going</li> <li>▪ Bi-annually</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager</li> <li>▪ Project Developer (Scatec Solar)</li> </ul>
11.9. Increased energy consumption during the operational phase.	Reduce energy consumption where possible.	<p>11.9.1. Encourage the use of energy saving equipment at the PV facility (such as low voltage lights and low pressure taps) and promote recycling. Operational personnel must be made aware of energy conservation practices as part of the environmental awareness training programme.</p>	<ul style="list-style-type: none"> <li>▪ Monitor energy usage via site investigations.</li> <li>▪ Conduct training for all operational personnel.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monthly</li> <li>▪ As and when required and ensure that all new staff are inducted.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager</li> <li>▪ Project Developer (Scatec Solar)</li> </ul>
11.10. Impact on the regional water balance as a result of increased water usage.	Reduce water usage during operations.	<p>11.10.1. Water conservation to be practiced in line with Energy Saving Policies as follows:</p> <ul style="list-style-type: none"> <li>▪ Cleaning methods utilised for cleaning vehicles, floors, the offices etc. should aim to minimise water use (e.g. sweep before wash-down).</li> <li>▪ Where possible, encourage the re-use of water.</li> <li>▪ Ensure that regular audits of water systems are conducted to identify possible water leakages.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Record water usage during the operational phase, conduct audits and record non-compliance and incidents.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monthly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager</li> </ul>
		<p>11.10.2. Consider installing water saving devices (e.g. dual flush toilets, automatic shut-off taps, etc.).</p>			
		<p>11.10.3. Carry out environmental awareness training with a discussion on water usage and conservation, and make operational personnel aware of the importance of limiting water wastage.</p>			

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
11.11. Non respect of waste management practices	Minimise the production of general waste.  Ensure compliance with relevant waste management legislation.  Minimise pollution of the environment.	11.11.1. Control and implement waste management plans. Ensure that relevant legislative requirements are respected.	▪ Control of waste management practices throughout operation phase.	▪ Monthly	▪ Facility Manager
		11.11.2. Determine specific areas on site for temporary management of waste.			
		11.11.3. Promote waste reduction, re-use, and recycling opportunities on site during the operation phase.	▪ Monitor waste generation and collection throughout operation.	▪ Monthly	▪ Facility Manager
		11.11.4. Ensure an adequate and sustainable use of resources.			
11.12. Excessive generation of waste water on site during the operation phase	Maintain reasonable levels of waste water generation	11.12.1. Waste water must be collected and disposed of at a suitable licenced disposal facility. Proof of disposal (i.e. waste disposal slips or waybills) should be retained on file for auditing purposes.	▪ Waste water generation to be monitored throughout the operational phase. ▪ Monitor waste disposal slips and waybills via site audits and record non-compliance and incidents.	▪ Quarterly	▪ Facility Manager
<b>D. DECOMMISSIONING PHASE</b>					
11.13. Ensure that the construction mitigation and management measures are adhered to during the decommissioning phase.					

### 7.9. Specific Project Related Environmental Impacts

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
<b>A. DESIGN PHASE</b>					
<b>A.1. VISUAL IMPACTS</b>					
12.1.Potential visual intrusion of construction activities on existing views of sensitive	Reduce visual intrusion of construction activities project wide.	12.1.1. Ensure plans are in place to minimise fire hazards and dust generation. 12.1.2. Ensure plans are in place to rehabilitate temporary cleared areas as soon as possible.	▪ Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.	▪ During design cycle and construction commences.	▪ Project Developer (Scatec Solar) ▪ ECO

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
visual receptors		12.1.3. Clearance of the area for the solar field should be phased in such a way that the exposed area is always at a minimum.	<ul style="list-style-type: none"> <li>Ensure that this is taken into consideration prior to the commencement of construction by reviewing signed minutes of meetings or signed reports.</li> </ul>	<ul style="list-style-type: none"> <li>Once-off during the design phase.</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> </ul>
	Reduce visual intrusion of the solar energy facility	12.1.4. A maintenance plan for buildings and structures should be in place. 12.1.5. Colours of buildings and structures should blend in with the landscape background where this is technically feasible and where it will not affect the functionality of the structures. 12.1.6. Materials, coatings and paints should be chosen based on minimal reflectivity. 12.1.7. Grouped structures should be painted in the same colour where this will not affect the functionality of the structures, to reduce visual complexity and contrast. 12.1.8. Appropriate coloured materials should be used for structures to blend in with the backdrop of the project. 12.1.9. Appropriate colours for smooth surfaces often need to be two to three shades darker than the background colour to compensate for shadows that darken most textured natural surfaces.	<ul style="list-style-type: none"> <li>Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.</li> </ul>	<ul style="list-style-type: none"> <li>During design cycle and before construction commences.</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar) and ECO</li> </ul>
12.2.Potential impact of night lighting of the Solar PV Facility on the nightscape of the region.	Reduce the impact of night lighting of structures and buildings associated with the solar energy facility on the surrounding nightscape and visual receptors.	12.2.1. A lighting plan for the proposed Solar PV plant that documents the design, layout and technology used for lighting purposes should be prepared, indicating how nightscape impacts will be minimised and that also demonstrates that project lighting is effectively shielded from surrounding and adjacent properties must be prepared with the design plans of the plant. The plan should minimize light spill onto neighbouring properties and glare which can affect visual receptors in the surrounding landscape. 12.2.2. The lighting plan should also minimize contribution to light pollution (night glow) of the regional nightscape. 12.2.3. The lighting plan should include a process for	<ul style="list-style-type: none"> <li>A lighting specialist should be contracted to design the lighting plan for the project. The plan should provide for temporary lighting during the construction and decommissioning phases of all components of the project.</li> <li>Ensure that this is taken into consideration during the planning and design phase by reviewing signed minutes of meetings or signed reports.</li> </ul>	<ul style="list-style-type: none"> <li>During design cycle and before construction commences.</li> <li>Once-off during the design phase.</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> <li>ECO</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<p>promptly addressing and mitigating complaints about potential lighting impacts.</p> <p>12.2.4. Lighting of the facility should not exceed, in number of lights and brightness, the minimum required for safety and security.</p> <p>12.2.5. Uplighting and glare (bright light) should be minimised using appropriate screening.</p> <p>12.2.6. Low-pressure sodium light sources should be used to reduce light pollution.</p> <p>12.2.7. Light fixtures should not spill light beyond the project boundary.</p> <p>12.2.8. Timer switches or motion detectors (within safety requirements) should be used to control lighting in areas that are not occupied continuously.</p>			
<b>A.2. HERITAGE IMPACTS (ARCHAEOLOGY AND CULTURAL LANDSCAPE)</b>					
12.3. Impacts to archaeology and graves (note that none are expected).	Achieve a layout that minimizes the potential later impacts to archaeological resources and/or graves.	12.3.1. Ensure that project layout avoids as many known archaeological resources and/or graves as possible.	<ul style="list-style-type: none"> <li>Take cognizance of the archaeological sites and graves reported in the HIA when designing facility layout.</li> </ul>	<ul style="list-style-type: none"> <li>Once-off</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> </ul>
12.4. Impacts to the natural and cultural landscape (note that none are expected).	Reduce the degree of visual contrast in the landscape.	12.4.1. Plan to use an earth-coloured paint on the built elements of the facility.	<ul style="list-style-type: none"> <li>Include earth-coloured paint in the design specifications for the facility.</li> </ul>	<ul style="list-style-type: none"> <li>Once-off</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> </ul>
<b>A.3. SOCIAL IMPACTS</b>					
12.5. In-migration of potential job seekers into the Kenhardt area	Proactively manage the in-migration of potential employment seekers and in so doing mitigate impacts on existing social structures.	<p>12.5.1. Develop and implement a Workforce Recruitment Plan</p> <p>12.5.2. Reserve employment, where practical, for local residents</p> <p>12.5.3. Clearly define and agree upon the Project Affected People (PAP)</p> <p>12.5.4. Develop a database of PAP and their relevant skills and experience</p> <p>12.5.5. Develop and implement a Stakeholder Engagement Plan</p>	<ul style="list-style-type: none"> <li>Mitigation measures (12.5.1); (12.5.4) and (12.5.5) requires the drafting of a document which would in each instance serve as the method through which the mitigation actions are monitored.</li> <li>Mitigation measures (12.5.2) and (12.5.3) requires clear statements regarding for whom work would be reserved (i.e. mitigation measure (12.5.2)) and who the PAP is (i.e. mitigation measure (12.5.3)).</li> </ul>	<ul style="list-style-type: none"> <li>Once-off during the design phase.</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
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12.6. Economic Development Plan	Draft an Economic Development Plan to align local investment with bona fide local needs.	<p>12.6.1. The proponent should engage with local NGOs, CBOs and local government structures to identify and agree upon relevant skills and competencies required in the Kenhardt community.</p> <p>12.6.2. Such skills and competencies should then be included in the Economic Development Plan.</p> <p>12.6.3. Where possible, align Economic development Plan with Local Municipality's IDP.</p> <p>12.6.4. Delivery on the Economic development Plan must be contractually binding on the proponent.</p>	<ul style="list-style-type: none"> <li>Mitigation measures 12.6.1; 12.6.4; 12.6.3 and 12.6.5 require the drafting of a document (i.e. the Economic development Plan) which would in each instance serve as the method through which the mitigation actions are monitored.</li> </ul>	<ul style="list-style-type: none"> <li>Once-off during the design phase.</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> </ul>
<b>A.4. ELECTROMAGNETIC AND RADIO FREQUENCY INTERFERENCE</b>					
12.7. Impact on the nearest and surrounding Square Kilometer Array (SKA) telescopes and the overall SKA project	<p>To reduce the impact of the proposed PV project on the SKA.</p> <p>To implement the mitigation measures correctly and achieve an improvement of between 20 and 40 dB in emissions levels.</p>	<p>12.7.1. The inverter units, transformers, communication and control units for an array of panels should all be housed in a single shielded environment. For shielding of such an environment it must be ensured that:</p> <ul style="list-style-type: none"> <li>Radio Frequency Interference (RFI) gasketting is placed on all the seams and doors.</li> <li>RFI Honeycomb filtering should be placed on all ventilation openings.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure that the requirements and mitigation practices are incorporated into the design of the proposed PV plant during the planning and design phase by reviewing signed minutes of meetings or signed reports.</li> </ul>	<ul style="list-style-type: none"> <li>Once-off during the design phase.</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> </ul>
		<p>12.7.2. It is important to ensure that the cables are laid directly in the soil or properly grounded cable trays (not plastic sleeves).</p> <p>12.7.3. The use of bare copper directly in the soil for earthing is recommended to shunt Common Mode (CM) interference currents to ground.</p> <p>12.7.4. In the case of a tracking PV plant design, care will need to be taken to shield the noise associated with the relays, contactors and hydraulic pumps/motors of the tracking units.</p> <p>12.7.5. Data communications to and from the plants should be via fibre optic.</p>			
		<p>12.7.6. An appropriate Electromagnetic Control (EMC) Plan should be developed to identify specific mitigation measures that will be implemented for Kenhardt PV 1.</p>	<ul style="list-style-type: none"> <li>Ensure that this is taken into consideration and a suitable specialist is appointed to compile the EMC Plan during the planning and design phase. Review signed minutes</li> </ul>	<ul style="list-style-type: none"> <li>During design cycle and before construction commences.</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar) and ECO</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
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		12.7.7. Ensure that the EMC Plan will be provided to the SKA for comment and approval during the design phase (i.e. approval from the SKA prior to the commencement of construction).	<ul style="list-style-type: none"> <li>of meetings or signed reports to ensure compliance.</li> <li>Ensure that the EMC Plan is submitted to the SKA for review and approval prior to construction. Review the comments and approval correspondence from the SKA and report any non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>During design cycle and before construction commences.</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar) and ECO</li> </ul>
<b>B. CONSTRUCTION PHASE</b>					
<b>B.1. ECOLOGICAL IMPACTS (TERRESTRIAL, AQUATIC AND AVIFAUNA)</b>					
12.8.Changes in edaphics (soils) on account of excavation and import of soils, resulting in changes in soil state, compaction, and alteration of plant communities and fossorial species in and around these points etc.	Avoidance of undue disturbance to soils	12.8.1. Ripping of compact soils to be considered according to site specifics and impact (i.e. either manual or machine driven ripping of compact soils to loosen surface material and improve percolation).	<ul style="list-style-type: none"> <li>If deemed applicable, Monitor the manual or machine driven ripping of compact soils.</li> </ul>	<ul style="list-style-type: none"> <li>Intermittent and upon identification of excess compaction or option of ripping is considered necessary (i.e. when and where extensive compaction arises)</li> </ul>	<ul style="list-style-type: none"> <li>Contractor and Project Developer (Scatec Solar)</li> </ul>
12.9.Abstraction from sub surface aquifers may have a significant impact on plant water relations.	To reduce excessive abstraction of sub surface waters and impacts on groundwater.	12.9.1. Identify yield and water quality levels in borehole prior to establishment (if borehole water will be used, which is unlikely based on the findings of the Geohydrology Assessment). 12.9.2. Identify limitations on rate and level of abstraction (if required and if (in the unlikely event that) borehole water will be used). 12.9.3. Identify alternative water sources (such as municipal supply) based on the recommendations made in the Geohydrology Assessment).	<ul style="list-style-type: none"> <li>Ensure borehole is registered with imposed limits on abstraction</li> <li>Undertake blow test on boreholes (if required)</li> <li>Undertake water quality analysis.</li> <li>Install flow meter during construction period and beyond (if borehole water will be used, which is unlikely based on the findings of the Geohydrology Assessment).</li> <li>Ensure that Municipal or alternate Supply is arranged prior to the commencement of the construction phase</li> </ul>	<ul style="list-style-type: none"> <li>Prior to construction</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar) and ECO</li> </ul>
12.10. Alteration of	To manage construction	12.10.1. Avoidance of significant earthworks with	<ul style="list-style-type: none"> <li>Undertake site and visual inspections</li> </ul>	<ul style="list-style-type: none"> <li>Ongoing</li> </ul>	<ul style="list-style-type: none"> <li>Contractors,</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
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surface water quality leading to changes in water chemistry.	activities that may impact on surface and subsurface water quality	<p>concomitant risk of increasing silt mobility.</p> <p>12.10.2. Conduct judicious excavation and clearance.</p> <p>12.10.3. Undertake stabilisation of disturbed soils.</p> <p>12.10.4. Implement the use of surface flow attenuators or energy dissipaters (if required).</p> <p>12.10.5. Management of potential liquid material that may be classified as hazardous.</p> <p>12.10.6. Management of hazardous waste.</p> <p>12.10.7. Avoid significant sculpting of land and maintenance of the general topography of site.</p>	<p>and reporting any non-compliance.</p> <ul style="list-style-type: none"> <li>▪ Containment of hazardous waste and hazardous materials.</li> </ul>		Project Developer (Scatec Solar) and ECO
12.11. Alteration of surface drainage patterns on account of construction activities leading to change in plant communities and general habitat structure	Limit alteration of surface drainage, leading to changes in plant communities and general habitat structure, patters due to construction activities.	<p>12.11.1. Avoidance of major drainage features during construction. The proposed project footprint must be demarcated to reduce unnecessary disturbance beyond the proposed project area. Demarcate as no-go areas.</p> <p>12.11.2. Undertaking and completion of earthworks and road construction outside of the high rainfall period (if possible).</p> <p>12.11.3. Avoidance of significant sculpting of land and maintenance of the general topography of the site.</p> <p>12.11.4. Maintenance of a high level of housekeeping on site during the construction phase.</p> <p>12.11.5. Inspection of drainage features immediately outside of the footprint of the proposed PV facility and undertake removal of solid waste and litter on a regular basis.</p>	<ul style="list-style-type: none"> <li>▪ Carry out visual inspections to ensure strict control over the behaviour of staff in order to restrict activities to within demarcated areas.</li> <li>▪ Monitor the construction period to verify if this is being undertaken (where possible).</li> <li>▪ Carry out visual inspections to ensure minimal impact on soils and erosion.</li> <li>▪ Monitor the condition of the site camp throughout the construction phase via visual site inspections. Record non-compliance and incidents.</li> <li>▪ Monitor the condition of drainage features immediately outside of the footprint of the PV plant and the condition of the construction area throughout the construction phase via visual site inspections. Record non-compliance and incidents.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ongoing</li> <li>▪ Ongoing</li> <li>▪ Ongoing</li> <li>▪ Ongoing</li> <li>▪ Ongoing</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> <li>▪ Contractor, Project Developer (Scatec Solar) and ECO</li> <li>▪ Contractor, Project Developer (Scatec Solar) and ECO</li> <li>▪ ECO</li> <li>▪ Contractor, Project Developer (Scatec Solar) and ECO</li> </ul>
<b>B.2. VISUAL IMPACTS</b>					
12.12. Potential visual intrusion of construction activities on existing views of sensitive	Prevent unnecessary visual clutter and focusing attention of surrounding visual receptors on the proposed development.	12.12.1. Preparation of the solar field area (i.e. clearance of vegetation, grading, contouring and compacting) and solar field construction should be phased in a way that makes practical sense in order to minimise the area of soil exposed and the shortest	<ul style="list-style-type: none"> <li>▪ Ensure that this is taken into consideration prior to the commencement of construction.</li> <li>▪ Conduct site inspections to monitor</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once-off during the construction phase.</li> <li>▪ Weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar)</li> <li>▪ ECO</li> </ul>



## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
visual receptors		duration of exposure.	the phasing of construction to verify unnecessary soil disturbance and clearing and report any non-compliance.		
		12.12.2. Parking areas should be demarcated and strictly controlled so that vehicles are limited to specific areas only.	<ul style="list-style-type: none"> <li>▪ Carry out visual inspections to ensure the construction area and parking area is demarcated clearly, and record and report any non-compliance.</li> <li>▪ Carry out visual inspections to ensure strict control over the parking of construction vehicles and access routes in order to restrict activities to within demarcated areas.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Weekly</li> <li>▪ Weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> <li>▪ ECO</li> </ul>
		12.12.3. Night time construction should be avoided where possible.	<ul style="list-style-type: none"> <li>▪ Construction operation times to be monitored and managed (as well as included in the tender contract).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> </ul>
		12.12.4. Night lighting of the construction sites should be minimised within requirements of safety and efficiency.	<ul style="list-style-type: none"> <li>▪ Complaints about night lights should be investigated and documented in a register.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Weekly or bi-weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor and ECO</li> </ul>
	Reduce the visual impact of construction activities project wide	12.12.5. Maintain good housekeeping on site to avoid litter and minimize waste. 12.12.6. Monitor construction sites for strict adherence to demarcated boundaries. 12.12.7. Monitor adherence to lighting plan. 12.12.8. Monitor adherence to rehabilitation plan. 12.12.9. Monitor adherence to erosion control plan. 12.12.10. Monitor adherence to dust and fire control plans.	<ul style="list-style-type: none"> <li>▪ Carry out site visits and inspections of the construction sites and ensure good housekeeping is maintained. Record and report any non-compliance.</li> <li>▪ Carry out site visits and record and report any non-compliance.</li> <li>▪ Complaints about night lights should be investigated and documented in a register. Investigate any complaints about night lights and document it in a register.</li> <li>▪ Visit sites requiring rehabilitation.</li> <li>▪ Carry out site visits and record and report any non-compliance.</li> <li>▪ Carry out site visits and record and report any non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily</li> <li>▪ Daily</li> <li>▪ Daily and as complaints arise.</li> <li>▪ Daily</li> <li>▪ Daily</li> <li>▪ Daily</li> </ul>	<ul style="list-style-type: none"> <li>▪ Construction Manager and ECO</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
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<b>B.3. HERITAGE IMPACTS (ARCHAEOLOGY AND CULTURAL LANDSCAPE)</b>					
12.13. Construction vehicles and activities could result in damage to or destruction of archaeological sites and/or graves.	Minimise the chances of significant archaeological sites and/or graves being disturbed.	12.13.1. Ensure that all heritage resources requiring mitigation are mitigated prior to the start of construction.	<ul style="list-style-type: none"> <li>▪ Carry out visual inspections to ensure strict control over the behaviour of construction staff in order to restrict activities to within demarcated areas.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> </ul>
		12.13.2. Ensure that no activity takes place outside of the authorized construction footprint.			
		12.13.3. The Contractor and ECO must be informed of the possibility of archaeological resources and graves (i.e. ensure that all personnel are aware of the potential of encountering graves and what to do if this occurs (i.e. to report any suspicious stone features prior to disturbance)).	<ul style="list-style-type: none"> <li>▪ Carry out Environmental Awareness Training to ensure that the Contractors are informed of the possible type of heritage features that may be encountered during the construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once-off training and ensure that all new staff are inducted.</li> <li>▪ Monthly</li> <li>▪ Once-off six months prior to construction.</li> <li>▪ As required/ necessary during the construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor/ ECO</li> <li>▪ ECO</li> </ul>
		12.13.4. Alternatively commission an archaeologist to examine the final development footprint at least six months prior to the commencement of construction.	<ul style="list-style-type: none"> <li>▪ Conduct audits of the signed attendance registers.</li> <li>▪ Appoint a professional archaeologist to examine the construction footprint.</li> <li>▪ Conduct an audit to verify that the necessary permits are obtained by the archaeologist, if required.</li> </ul>		
		12.13.5. If archaeological sites and potential graves cannot be avoided, the buffers as stipulated in the HIA should be implemented during the construction phase.	<ul style="list-style-type: none"> <li>▪ Carry out visual inspections to ensure strict control over the behaviour of construction staff in order to restrict activities to within demarcated areas and outside of the buffer area.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> </ul>
		12.13.6. If any concentrations of archaeological material, graves or stone features are uncovered during the proposed construction, work in the immediate area should be halted. The find would need to be reported to the heritage authorities (i.e. the SAHRA APM Unit (Natasha Higgitt/Phillip Hine 021 462 5402 must be altered) and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution. Sufficient time should be allowed to remove/collect such material. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves	<ul style="list-style-type: none"> <li>▪ Monitor excavations and construction activities for archaeological materials via visual inspections and report the finds accordingly.</li> <li>▪ Contact the heritage authorities and the identified archaeologist if any heritage features are uncovered.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily or during excavations.</li> <li>▪ As required/ necessary during the construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor and ECO</li> <li>▪ Project Developer (Scatec Solar)</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		(BGG) Unit (Itumeleng Masiteng/Mimi Seetelo 012 320 8490), must be alerted immediately. A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings.			
12.14. Alteration of the landscape from rural to industrial in nature.	Reduce visual contrast of the development in the landscape.	12.14.1. Use earthy-coloured paint on built elements	<ul style="list-style-type: none"> <li>Monitor the paint colour via visual inspections and report non-compliance</li> </ul>	<ul style="list-style-type: none"> <li>Once-off, at an appropriate time during construction period.</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> </ul>
<b>B.4. PALAEOLOGICAL HERITAGE IMPACTS</b>					
12.15. Loss of legally-protected palaeontological heritage resources at or beneath ground surface within development footprint (fossils, fossil sites and contextual geological data).	Reporting, conservation, recording and judicious sampling of scientifically important fossil material exposed during the construction phase of development.	12.15.1. Reporting chance fossil finds to SAHRA for possible professional mitigation.	<ul style="list-style-type: none"> <li>Monitoring of all substantial excavations into sedimentary bedrocks for fossil material (e.g. vertebrate bones &amp; teeth, fossilized wood, shells)</li> <li>Safeguarding of chance fossil finds, preferably <i>in situ</i>.</li> </ul>	<ul style="list-style-type: none"> <li>Throughout the construction phase</li> <li>Throughout the construction phase</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> <li>ECO</li> </ul>
		12.15.2. Recording and sampling of fossil material and associated geological data (only necessary for chance fossil finds made during the proposed development).	<ul style="list-style-type: none"> <li>Application by a qualified palaeontologist for fossil collection permit from SAHRA.</li> <li>Palaeontologist to undertake field study of fossil finds <i>in situ</i> on site. Photography and sampling of important finds.</li> <li>Curation of fossils collected in an approved repository (museum/university collection).</li> </ul>	<ul style="list-style-type: none"> <li>Following alert of chance fossil finds on site (It is important to note that there is no need for on-site palaeontological monitoring unless new fossil finds are made during development).</li> </ul>	<ul style="list-style-type: none"> <li>Qualified palaeontologist appointed and commissioned by the Project Developer.</li> <li>Qualified palaeontologist appointed and commissioned by the Project Developer</li> <li>Qualified palaeontologist appointed and commissioned by the Project Developer</li> </ul>
<b>B.5. SOILS AND AGRICULTURAL POTENTIAL IMPACTS</b>					

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
12.16. Degradation of veld vegetation beyond the direct footprint of the proposed PV facility due to construction disturbance and potential trampling by vehicles	To conserve the surrounding natural veld vegetation.	<p>12.16.1. Minimize footprint of disturbance during the construction phase and ensure that construction work is undertaken within the demarcated area only.</p> <p>12.16.2. Confine vehicle access on roads only.</p> <p>12.16.3. Control dust generation during construction activities by implementing standard construction site dust control measures (dampening with water) where required. Because of water scarcity, this should only be done where and when dust generation is a significant problem.</p>	<ul style="list-style-type: none"> <li>▪ Monitor the construction activities via site audits to ensure that they are undertaken within the demarcated construction area, and record non-compliance and incidents.</li> <li>▪ Include periodic site inspection in environmental performance reporting that specifically records occurrence or not of off-road vehicle tracks surrounding the site. Monitor via site audits and record non-compliance and incidents.</li> <li>▪ Monitor dust suppression mechanisms via visual inspections and record non-compliances. Maintain an incidents/complaints register. The date, time, nature of complaint, name of complainant and corrective actions must be logged for all complaints. Complaints must be investigated and, if appropriate, acted upon.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily</li> <li>▪ Monthly during the construction phase</li> <li>▪ Monthly and during complaints/incidents</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor and ECO</li> <li>▪ ECO</li> <li>▪ Contractor and ECO</li> </ul>
12.17. Loss of topsoil due to poor topsoil management	Ensure effective topsoil covering to conserve soil fertility on all disturbed areas, after they have been rehabilitated.	<p>12.17.1. Strip and stockpile topsoil from all areas where soil (below surface) will be disturbed.</p> <p>12.17.2. After cessation of disturbance, re-spread topsoil over the surface.</p> <p>12.17.3. Dispose of any sub-surface spoils from excavations where they will not impact on land that supports vegetation, or where they can be effectively covered with topsoil.</p>	<ul style="list-style-type: none"> <li>▪ Establish an effective record keeping system for each area where soil is disturbed for construction purposes. These records should be included in environmental performance reports, and should include all the records below: <ul style="list-style-type: none"> <li>○ Record the GPS coordinates of each area.</li> <li>○ Record the date of topsoil stripping.</li> <li>○ Record the GPS coordinates of where the topsoil is stockpiled.</li> <li>○ Record the date of cessation of construction activities at the particular site.</li> <li>○ Photograph the area on cessation of construction activities.</li> <li>○ Record date and depth of re-</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ As needed, dependent on the specifics of construction activities.</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
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			<ul style="list-style-type: none"> <li>spreading of topsoil.</li> <li>○ Photograph the area on completion of rehabilitation and on an annual basis thereafter to show vegetation establishment and evaluate progress of restoration over time.</li> </ul>		
12.18. Soil erosion due to alteration of the land surface characteristics	To reduce erosion on site and downstream of the site as a result of run-off from the site, or due to wind erosion.	12.18.1. Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion.	<ul style="list-style-type: none"> <li>▪ Include periodic site inspection in environmental performance reporting that inspects the effectiveness and integrity of the run-off control system and specifically records the occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monthly during the construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> </ul>
<b>B.6. SOCIAL IMPACTS</b>					
12.19. Influx of job seekers into the Kenhardt area.	Control influx of job seekers into the Kenhardt area with the aim of protecting local social structures.	12.19.1. Implement the Workforce Recruitment Plan. 12.19.2. Ensure employment is reserved, where practical, for local residents. 12.19.3. Actively use the database of PAP and their relevant skills and experience to guide local employment. 12.19.4. Implement the Stakeholder Engagement Plan.	<ul style="list-style-type: none"> <li>▪ Verify that local labour is, as far as practically possible, being used, by cross-referencing the Workforce Recruitment Plan with current recruitment practices, as well as cross-referencing employed personnel with PAP database;</li> <li>▪ Verify that Stakeholder Engagement Plan is being implemented with written proof of such engagement with the PAP.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Three times during the estimated 14 month construction period (i.e. at 3 months, 6 months, and 9 months).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Construction Manager and ECO</li> </ul>
12.20. Outsiders moves into the Kenhardt area	Limit incidences of in social deviance in the Kenhardt area.	12.20.1. Implement the Workforce Recruitment Plan 12.20.2. Ensure employment is reserved, where practical, for local residents 12.20.3. Actively use the database of PAP and their relevant skills and experience to guide local employment 12.20.4. Implement the Stakeholder Engagement Plan	<ul style="list-style-type: none"> <li>▪ Verify that local labour is, as far as practically possible, being used, by cross-referencing the Workforce Recruitment Plan with current recruitment practices, as well as cross-referencing employed personnel with PAP database;</li> <li>▪ Verify that Stakeholder Engagement Plan is being implemented with written proof of such engagement with the PAP.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Three times during the estimated 14 month construction period (i.e. at 3 months, 6 months, and 9 months).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Construction Manager and ECO</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
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12.21. Expectations created regarding possible employment	Prevent frustration resulting from miscommunication of employment opportunities and project-related benefits in the local community.	12.21.1. Implement the Stakeholder Engagement Plan	<ul style="list-style-type: none"> <li>Verify that Stakeholder Engagement Plan is being implemented with written proof of such engagement with the PAP.</li> </ul>	<ul style="list-style-type: none"> <li>Three times during the estimated 14 month construction period (i.e. at 3 months, 6 months, and 9 months).</li> </ul>	<ul style="list-style-type: none"> <li>Construction Manager and ECO</li> </ul>
12.22. Local spending	Ensure the generation of socio-economic benefits as a result of the multiplier effect.	12.22.1. Procure goods and services, where practical, within the study area 12.22.2. Obtain regularly required goods and services from as large a selection of local service providers as possible	<ul style="list-style-type: none"> <li>Verify purchase of local goods and services through proof of purchase.</li> </ul>	<ul style="list-style-type: none"> <li>Three times during the estimated 14 month construction period (i.e. at 3 months, 6 months, and 9 months).</li> </ul>	<ul style="list-style-type: none"> <li>Construction Manager and ECO</li> </ul>
12.23. Local employment	Ensure optimum employment creation while taking cognizance of the local levels of experience and education.	12.23.1. Implement the Workforce Recruitment Plan	<ul style="list-style-type: none"> <li>Verify that local labour is, as far as practically possible, being used, by cross-referencing the Workforce Recruitment Plan with current recruitment practices, as well as cross-referencing employed personnel with PAP database.</li> </ul>	<ul style="list-style-type: none"> <li>Three times during the estimated 14 month construction period (i.e. at 3 months, 6 months, and 9 months).</li> </ul>	<ul style="list-style-type: none"> <li>Construction Manager and ECO</li> </ul>
12.24. Economic Development Plan	Ensure contribution to local employment, local spending and human capacity development is being made.	12.24.1. Implement the Economic Development Plan	<ul style="list-style-type: none"> <li>Verify that the Economic development Plan is being implemented.</li> </ul>	<ul style="list-style-type: none"> <li>Three times during the estimated 14 month construction period (i.e. at 3 months, 6 months, and 9 months).</li> </ul>	<ul style="list-style-type: none"> <li>Construction Manager and ECO</li> </ul>
<b>B.7. GEOHYDROLOGY IMPACTS</b>					
12.25. Potential impact on groundwater as a result of the construction of storage yards and temporary labour accommodation camps (i.e. wastewater from construction activities disposed of on the site	To prevent unnecessary infiltration of polluted surface water	12.25.1. Waste water from labour accommodation site camps or yards must be collected in a designated container and disposed of at a suitable disposal point off site (i.e. a licenced waste disposal facility). A suitable waste contractor must be appointed to collect waste from site on a regular basis for correct disposal. Proof of disposal (waybills or waste disposal slips) must be retained and kept on file for auditing purposes.  12.25.2. Other non-hazardous solid waste (e.g. refuse) to be disposed of at a licensed landfill. A suitable waste contractor must be appointed to collect waste from site on a regular basis for correct disposal.	<ul style="list-style-type: none"> <li>Monitor the placement of structures, storage yards, accommodation camps and infrastructure during the construction phase to ensure existing wind pumps / boreholes are not damaged.</li> <li>Waste removal and disposal to be monitored. Monitor via site audits and record non-compliance and incidents. Monitor waste disposal slips and waybills via site audits and record non-compliance and incidents.</li> </ul>	<ul style="list-style-type: none"> <li>Once off prior to the commencement of construction.</li> <li>Weekly</li> <li>Four times per annum for the construction period, i.e. at 3 months, 6 months, 9 months and 12 months.</li> <li>Weekly</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> <li>Project Developer (Scatec Solar) and ECO</li> <li>Project Developer (Scatec Solar) and ECO</li> <li>Project</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
leading to environmental impacts (e.g. groundwater pollution))		<p>Proof of disposal (waybills or waste disposal slips) must be retained and kept on file for auditing purposes.</p> <p>12.25.3. Avoid using old or damaged construction equipment and vehicles and ensure that they are well maintained and regularly serviced in order to ensure no leakages.</p> <p>12.25.4. Any engines that stand in one place must have drip trays, fuel storage tanks should be above ground on an impermeable surface (within a bunded area) and construction vehicles and equipment should also be refuelled on an impermeable surface. A designated area should be established at the construction site camp for refuelling activities and drip trays or similar impervious materials must be used during these procedures. Vehicle and washing areas must also be on paved surfaces and the by-products correctly managed.</p>	<ul style="list-style-type: none"> <li>▪ Construction vehicles need to be monitored throughout the construction phase. Monitor via site audits and record non-compliance and incidents.</li> <li>▪ Monitor the placement and designation of the area for refuelling at the site camp via visual inspections. Monitor the usage of spill containment measures and record and report non-compliance.</li> </ul>		Developer (Scatec Solar) and ECO
12.26. Potential impact on groundwater as a result of stormwater outflows	To prevent unnecessary infiltration of polluted storm water	12.26.1. Ensure the storm water runoff is not contaminated. All reasonable measures must be taken to prevent the contamination of storm water outflows.	<ul style="list-style-type: none"> <li>▪ Monitor the quality of the storm water</li> <li>▪ ECO to verify that measures are in place to reduce the contamination of storm water and to monitor the quality of storm water by undertaking site visits and visual inspections.</li> </ul>	<ul style="list-style-type: none"> <li>▪ If possible do this during or shortly after a storm event, at the start of the rain season.</li> <li>▪ Weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar) and ECO.</li> <li>▪ ECO</li> </ul>
12.27. Potential impact on groundwater quality as a result of accidental oil spillages or fuel leakages.	To reduce the potential of groundwater pollution.	<p>12.27.1. Avoid using old or damaged construction equipment and vehicles and ensure that they are well maintained and regularly serviced in order to ensure no leakages.</p> <p>12.27.2. Any engines that stand in one place for an excessive length of time, must have drip trays, fuel storage tanks should be above ground on an impermeable surface (within a bunded area) and construction vehicles and equipment should also be refuelled on an impermeable surface. A designated area should be established at the construction site camp for refuelling activities and drip trays or similar impervious materials must be used during these procedures. If liquid product is being transported it must be ensured this does not spill</p>	<ul style="list-style-type: none"> <li>▪ Construction vehicles need to be monitored throughout the construction phase. Monitor via site audits and record non-compliance and incidents.</li> <li>▪ Monitor the placement and designation of the area for refuelling at the site camp via visual inspections. Monitor the usage of spill containment measures and record and report non-compliance.</li> <li>▪ Monitor the refuelling/ servicing process and record the occurrence of any spillages.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Four times per annum for the construction period, i.e. at 3 months, 6 months, 9 months and 12 months.</li> <li>▪ Weekly</li> <li>▪ Weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar) and ECO</li> <li>▪ Project Developer (Scatec Solar) and ECO</li> <li>▪ Project Developer (Scatec Solar) and ECO</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<p>during transit.</p> <p>12.27.3. If spillages occur during refuelling, they should be contained and removed as rapidly as possible, with correct disposal of the spilled material. Proof of disposal (waste disposal slips or waybills) should be obtained and retained on file for auditing purposes. During the operational phase, the same principles should be adhered to. Emergency measures and plans must be put in place and rehearsed in order to prepare for accidental spillage.</p>			
<b>B.8. WASTE MANAGEMENT</b>					
<p>12.28. Pollution of the surrounding environment (including drainage lines) as a result of the handling, temporary stockpiling and disposal of general waste.</p>	<p>Reduce environmental impacts such as soil, surface water and groundwater contamination as a result of incorrect storage, handling and disposal of general waste.</p> <p>Minimise the production of waste.</p>	<p>12.28.1. General waste (i.e. construction waste, building rubble, discarded concrete, bricks, tiles, wood, glass, window panes, air conditioners, plastic, metal, excavated material, packaging material, paper and domestic waste etc.) generated during the construction phase should be stockpiled temporarily (i.e. once-off) on site in a designated area within suitable waste collection bins and skips (or similar). Waste collection bins and skips should be covered with suitable material, where appropriate.</p>	<ul style="list-style-type: none"> <li>▪ Monitor the strategic placement of the temporary, designated waste stockpiling area at the site camp via visual inspections, and record and report any non-compliance.</li> <li>▪ Monitor the temporary storage and handling of general waste on site via site audits and record non-compliance and incidents (i.e. conduct visual inspections of the temporary waste storage area).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once-off prior to the commencement of the construction phase and as required as the construction phase process evolves.</li> <li>▪ Daily</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO and Contractor</li> <li>▪ ECO</li> </ul>
	<p>Prevent environmental problems (e.g. pollution / change in soil pH) due to solid and liquid wastes disposed of on the site.</p> <p>Ensure compliance with waste management legislation.</p>	<p>12.28.2. Should the on-site stockpiling of general waste exceed 100 m<sup>3</sup> and a period of 90 days, then the National Norms and Standards for the Storage of Waste (published on 29 November 2013 under GN 926) must be adhered to.</p>	<ul style="list-style-type: none"> <li>▪ Record the amount of general waste that is temporarily stockpiled at the designated area on site, as well as the duration and record non-compliance and incidents.</li> <li>▪ Monitor the duration and amounts of general waste that is temporarily stockpiled at the designated area on site via site audits and record non-compliance and incidents (i.e. conduct visual inspections of the temporary waste storage area).</li> <li>▪ Audit compliance with the Norms and Standards for the Storage of Waste (published on 29 November 2013 under GN 926) if the storage amounts</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily</li> <li>▪ Weekly</li> <li>▪ Monthly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor</li> <li>▪ ECO</li> <li>▪ Project Developer (Scatec Solar).</li> </ul>



## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
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			are exceeded (i.e. only if required).		
		12.28.3. Ensure that the designated stockpiling area for general waste (i.e. skips and waste collection bins) is inspected on a daily basis to verify its condition and integrity, particularly after rainfall events.	<ul style="list-style-type: none"> <li>▪ Monitor the temporary, designated waste stockpiling area at the site camp, as well as the handling of general waste on site via site audits and record non-compliance and incidents.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> </ul>
		12.28.4. Ensure that general waste generated during the construction phase is removed from the site on a regular basis, and safely disposed of at an appropriate, licenced waste disposal facility by an approved waste management Contractor. Waste disposal slips or waybills should be kept on file as proof of disposal. As a general principle, waste manifests must be obtained to prove legal disposal of waste.	<ul style="list-style-type: none"> <li>▪ Ensure that a suitable Waste Management Contractor is appointed to remove and dispose the general waste at an appropriate, licenced waste disposal facility.</li> <li>▪ Monitor waste disposal slips and waybills via site audits and record non-compliance and incidents.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once-off prior to the construction phase.</li> <li>▪ Weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer (Scatec Solar)/ Contractor</li> <li>▪ ECO</li> </ul>
		12.28.5. Ensure that the construction site is kept clean at all times and that construction personnel are made aware of correct waste disposal methods. Littering must be prevented through effective site camp management.	<ul style="list-style-type: none"> <li>▪ Monitor the condition of the site camp throughout the construction phase via visual site inspections. Record non-compliance and incidents.</li> <li>▪ Carry out Environmental Awareness Training.</li> <li>▪ Conduct audits of the signed attendance registers.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily</li> <li>▪ Once-off training and ensure that all new staff are inducted.</li> <li>▪ Monthly</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO and Contractor</li> <li>▪ ECO and Contractor</li> <li>▪ ECO</li> </ul>
		12.28.6. Sufficient general waste disposal bins must also be provided for use by construction personnel throughout the site. These bins must be emptied on a regular basis.	<ul style="list-style-type: none"> <li>▪ Monitor general waste generation by construction staff and collection via audits throughout the construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily or Weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO and Contractor.</li> </ul>
		12.28.7. Ensure that all general waste emanating from the construction phase is removed from site prior to the commencement of the rehabilitation and operational phases.	<ul style="list-style-type: none"> <li>▪ Undertake a final inspection at the end of the construction phase in order to verify and ensure that all general waste is removed from site and correctly disposed, prior to the commencement of the rehabilitation and operational phases.</li> </ul>	<ul style="list-style-type: none"> <li>▪ At the end of the construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO and Contractor.</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
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		12.28.8. Promote waste reduction, re-use, and recycling opportunities on site during the construction phase.	<ul style="list-style-type: none"> <li>▪ Monitor waste generation and collection throughout construction.</li> <li>▪ Investigate if any complaints have been expressed by the surrounding community regarding waste handling.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Weekly or bi-weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO Contractor and Contractor</li> </ul>
		12.28.9. Ensure an adequate and sustainable use of resources.	<ul style="list-style-type: none"> <li>▪ Monitor waste generation and collection throughout construction.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Weekly or bi-weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO Contractor and Contractor</li> </ul>
		12.28.10. Control and implement waste management plans provided by contractors. Ensure that relevant legislative requirements are respected.	<ul style="list-style-type: none"> <li>▪ Control of waste management practices throughout construction phase</li> </ul>	<ul style="list-style-type: none"> <li>▪ Weekly or bi-weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO Contractor and Contractor</li> </ul>
12.29. Pollution of the surrounding environment as a result of the handling, temporary stockpiling and disposal of hazardous waste.	Reduce environmental impacts such as soil, surface water and groundwater contamination as a result of incorrect storage, handling and disposal of hazardous waste.	12.29.1. Hazardous waste (i.e. empty tins, oils, fuel spillages, spilled materials and chemicals etc.) generated during the construction phase should be stockpiled temporarily (i.e. once-off) on site in a designated area in suitable waste collection bins and leak-proof storage skips (or similar). Waste collection bins and skips should be covered with suitable material, where appropriate. Hazardous waste must be stored separately from all other general waste. The designated stockpiling area must be labelled correctly.	<ul style="list-style-type: none"> <li>▪ Monitor the strategic placement of the temporary, designated waste stockpiling area at the site camp via visual inspections, and record and report any non-compliance.</li> <li>▪ Monitor the temporary storage and handling of hazardous waste on site via site audits and record non-compliance and incidents (i.e. conduct visual inspections of the temporary waste storage area).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once-off prior to the commencement of the construction phase and as required as the construction process evolves.</li> <li>▪ Daily</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO Contractor and Contractor</li> <li>▪ ECO</li> </ul>
		12.29.2. Should the on-site stockpiling of hazardous waste exceed 80 m <sup>3</sup> , then the National Norms and Standards for the Storage of Waste (published on 29 November 2013 under GN 926) must be adhered to.	<ul style="list-style-type: none"> <li>▪ Record the amount of hazardous waste that is temporarily stockpiled at the designated area on site, as well as the duration and record non-compliance and incidents.</li> <li>▪ Monitor the duration and amounts of hazardous waste that is temporarily stockpiled at the designated area on site via site audits and record non-compliance and incidents (i.e. conduct visual inspections of the temporary waste storage area).</li> <li>▪ Audit compliance with the Norms and Standards for the Storage of Waste (published on 29 November 2013 under GN 926) if the storage amounts are exceeded (i.e. only if required).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily</li> <li>▪ Weekly</li> <li>▪ Monthly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor</li> <li>▪ ECO</li> <li>▪ Project Developer (Scatec Solar).</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		12.29.3. Ensure that the designated stockpiling area for hazardous waste (i.e. leak proof skips and waste collection bins) is inspected on a daily basis to verify its condition and integrity, particularly after rainfall events.	<ul style="list-style-type: none"> <li>Monitor the temporary, designated waste stockpiling area at the site camp, as well as the handling of hazardous waste on site via site audits and record non-compliance and incidents.</li> </ul>	<ul style="list-style-type: none"> <li>Daily</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> </ul>
		12.29.4. Ensure that all hazardous waste is removed from the site on a regular basis, and safely disposed at an appropriate, licenced hazardous waste disposal facility by an approved waste management Contractor.	<ul style="list-style-type: none"> <li>Ensure that a suitable Waste Management Contractor is appointed to remove and dispose the hazardous waste at an appropriate, licenced hazardous waste disposal facility.</li> <li>Monitor waste disposal slips and waybills via site audits and record non-compliance and incidents.</li> </ul>	<ul style="list-style-type: none"> <li>Once-off prior to the construction phase.</li> <li>Weekly</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)/ Contractor</li> <li>ECO</li> </ul>
		12.29.5. Ensure that the construction site is kept clean at all times and that construction personnel are made aware of correct waste disposal methods. Littering must be prevented through effective site camp management.	<ul style="list-style-type: none"> <li>Monitor the condition of the site camp throughout the construction phase via visual site inspections. Record non-compliance and incidents.</li> <li>Carry out Environmental Awareness Training.</li> <li>Conduct audits of the signed attendance registers.</li> </ul>	<ul style="list-style-type: none"> <li>Daily</li> <li>Once-off training and ensure that all new staff are inducted.</li> <li>Monthly</li> </ul>	<ul style="list-style-type: none"> <li>ECO and Contractor</li> <li>ECO and Contractor</li> <li>ECO</li> </ul>
		12.29.6. Ensure that all hazardous waste emanating from the construction phase is removed from site prior to the commencement of the rehabilitation and operational phases.	<ul style="list-style-type: none"> <li>Undertake a final inspection at the end of the construction phase in order to verify and ensure that all general waste is removed from site and correctly disposed, prior to the commencement of the rehabilitation and operational phases.</li> </ul>	<ul style="list-style-type: none"> <li>At the end of the construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>ECO and Contractor.</li> </ul>
		12.29.7. All liquid waste (used oil, paints, lubricating compounds and grease) to be packaged and disposed of by appropriate means.	<ul style="list-style-type: none"> <li>Waste removal and disposal to be monitored throughout construction</li> </ul>	<ul style="list-style-type: none"> <li>Weekly or bi-weekly</li> </ul>	<ul style="list-style-type: none"> <li>ECO and Contractor</li> </ul>
		12.29.8. Adequate containers for the cleaning of equipment and materials (paint, solvent) must be provided as to avoid spillages.	<ul style="list-style-type: none"> <li>Waste removal and disposal to be monitored throughout construction</li> </ul>	<ul style="list-style-type: none"> <li>Weekly or bi-weekly</li> </ul>	<ul style="list-style-type: none"> <li>ECO and Contractor</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		12.29.9. Waste water from construction and painting activities must be collected in a designated container and disposed of at a suitable disposal point off site.	<ul style="list-style-type: none"> <li>Waste removal and disposal to be monitored throughout construction</li> </ul>	<ul style="list-style-type: none"> <li>Weekly or bi-weekly</li> </ul>	<ul style="list-style-type: none"> <li>ECO Contractor and Contractor</li> </ul>
		12.29.10. Control and implement waste management plans provided by contractors. Ensure that relevant legislative requirements are respected.	<ul style="list-style-type: none"> <li>Control of waste management practices throughout construction phase</li> </ul>	<ul style="list-style-type: none"> <li>Weekly or bi-weekly</li> </ul>	<ul style="list-style-type: none"> <li>ECO Contractor and Contractor</li> </ul>
<b>C. OPERATIONAL PHASE</b>					
<b>C.1. ECOLOGICAL IMPACTS (TERRESTRIAL, AQUATIC AND AVIFAUNA)</b>					
12.30. Erosion control measures. The impact of wind and water erosion results in loss of surface soils and degradation of land.	To mitigate and manage the site to prevent any soil loss arising from wind and water.	12.30.1. Where appropriate and within the general drainage of the site, attenuators (or similar) should serve to reduce flow energy, while the maintenance of general vegetation cover to avoid excessive aeolian impacts should be implemented.	<ul style="list-style-type: none"> <li>Monitor the erosion on site during operations, as well as the implementation and effectiveness of erosion control on site (such as the use of gabions and geofabric materials or similar) at appropriate points.</li> </ul>	<ul style="list-style-type: none"> <li>Ongoing and as required</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar) and Environmental Manager</li> </ul>
12.31. Alteration of the state of subsurface water resources due to excessive abstraction of groundwater for the cleaning of the PV panels, as well as for operational use.	To reduce excessive abstraction of sub surface waters and impacts on groundwater.	12.31.1. Identify alternative water sources (such as municipal supply) based on the recommendations made in the Geohydrology Assessment). 12.31.2. Preferential use of recycled water sources for operational phase requirements (instead of groundwater). 12.31.3. Ensure the prudent use of surface water resources. 12.31.4. Adopt “dry” cleaning methods, such as dusting and sweeping the site before washing down. 12.31.5. Increased monitoring of the impact of dust generation and implement a more judicious cleaning protocol. 12.31.6. Low level and ongoing cleaning of PV panels over time to reduce demand on aquifers.	<ul style="list-style-type: none"> <li>Ensure that Municipal Supply or alternate supply is arranged prior to the commencement of the operational phase.</li> <li>Monitor via site audits and record non-compliance and incidents.</li> </ul>	<ul style="list-style-type: none"> <li>During the operational phase.</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar) and ECO</li> </ul>
<b>C.2. VISUAL IMPACTS</b>					
12.32. Potential visual intrusion of the proposed Solar Energy Facility on	Reduce visual intrusion of the solar energy facility on the views of sensitive visual receptors as well as its impact	12.32.1. Monitor effectiveness of the rehabilitation plan for temporarily cleared areas and erosion scarring. 12.32.2. Monitor building and façade maintenance. Painted	<ul style="list-style-type: none"> <li>Carry out visual inspections during site audits to verify the effectiveness of the rehabilitation, and record and</li> </ul>	<ul style="list-style-type: none"> <li>Monthly</li> <li>Annually</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar) and</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
the views of sensitive visual receptors.	on the surrounding landscape	features should be maintained and repainted when colour fades or paint flakes.	<p>report any non-compliance.</p> <ul style="list-style-type: none"> <li>Carry out an inspection of solar energy facility to ensure that it is being maintained in a good condition.</li> </ul>		<p>Environmental Manager</p> <ul style="list-style-type: none"> <li>Project Developer (Scatec Solar) and Environmental Manager</li> </ul>
		<p>12.32.3. Maintain re-vegetated surfaces until a self-sustaining stand of vegetation is established and visually adapted to the undisturbed surrounding vegetation. No new disturbance should be created during operations without approval from the Environmental Manager.</p> <p>12.32.4. Restoration of disturbed land should commence as soon after disturbance as possible.</p> <p>12.32.5. Road maintenance activities should avoid damaging or disturbing vegetation.</p> <p>12.32.6. Dust and noxious weed control should be part of maintenance activities.</p>	<ul style="list-style-type: none"> <li>Carry out visual inspections during site audits to verify the effectiveness of the rehabilitation and the progress of rehabilitation, and record and report any non-compliance.</li> <li>Ensure that all vegetation removal outside of the project footprint is approved by the Environmental Manager.</li> <li>Monitor the road maintenance process to ensure limited damage to vegetation. Record and report any non-compliance.</li> <li>Monitor the presence of alien vegetation on site.</li> <li>Monitor dust suppression mechanisms and record non-compliances. Maintain an incidents/ complaints register, in which any complaints from the public must be logged. The date, time, nature of complaint, name of complainant and corrective actions must be logged for all complaints. Complaints must be investigated and, if appropriate, acted upon.</li> </ul>	<ul style="list-style-type: none"> <li>Weekly during the rehabilitation phase</li> <li>Throughout the operational phase</li> <li>During road maintenance activities.</li> <li>Throughout the operational phase</li> <li>During complaints/ incidents</li> </ul>	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Project Developer (Scatec Solar) and Environmental Manager</li> <li>Project Developer (Scatec Solar) and Environmental Manager</li> <li>Project Developer (Scatec Solar) and Environmental Manager</li> </ul>
12.33. Potential impact of night lighting of the proposed Solar Energy Facility on the nightscape of	Reduce the impact of night lighting of the proposed PV facility on the surrounding nightscape and sensitive visual receptors.	12.33.1. Monitor the effectiveness of the lighting plan to minimize light spill and glare.	<ul style="list-style-type: none"> <li>Visit surrounding neighbouring farmsteads and ensure that residents in the surrounding landscape are not affected by glaring lights from the plant.</li> <li>Complaints about night lights should</li> </ul>	<ul style="list-style-type: none"> <li>Once off at the end of the construction phase or the start of the operational Phase.</li> <li>As complaints arise.</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar) and Environmental Manager</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
the region.			be investigated and documented in a register. Investigate any complaints about night lights and document it in a register.		<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar) and Environmental Manager</li> </ul>
		12.33.2. Lights should be switched off when not in use whenever it is in line with safety and security.	<ul style="list-style-type: none"> <li>Carry out visual inspections during site audits to monitor lighting, and record and report any non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>Weekly</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar) and Environmental Manager</li> </ul>
<b>C.3. HERITAGE IMPACTS (ARCHAEOLOGY AND CULTURAL LANDSCAPE)</b>					
12.34. Maintenance vehicles and activities could result in damage to or destruction of archaeological sites and/or graves.	Minimise the chances of significant archaeological sites and/or graves being disturbed.	12.34.1. Ensure that no activity takes place outside of the authorized operational footprint.	<ul style="list-style-type: none"> <li>Carry out visual inspections to ensure strict control over the behaviour of operational staff in order to restrict activities to within demarcated areas.</li> </ul>	<ul style="list-style-type: none"> <li>Weekly</li> </ul>	<ul style="list-style-type: none"> <li>Environmental Manager</li> </ul>
<b>C.4. SOILS AND AGRICULTURAL POTENTIAL IMPACTS</b>					
12.35. Soil erosion due to alteration of the land surface characteristics	To reduce erosion on site and downstream of the site as a result of run-off from the site, or due to wind erosion.	12.35.1. Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion.	<ul style="list-style-type: none"> <li>Include periodic site inspection in environmental performance reporting that inspects the effectiveness and integrity of the run-off control system and specifically records the occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.</li> </ul>	<ul style="list-style-type: none"> <li>Quarterly during the Operational Phase.</li> </ul>	<ul style="list-style-type: none"> <li>Environmental Manager</li> </ul>
<b>C.5. SOCIAL IMPACTS</b>					
12.36. Influx of job seekers into the Kenhardt area.	Control influx of job seekers into the Kenhardt area with the aim of protecting local social structures.	12.36.1. Implement the Workforce Recruitment Plan 12.36.2. Ensure employment is reserved, where practical, for local residents	<ul style="list-style-type: none"> <li>Verify that local labour is, as far as practically possible, being used, by cross-referencing the Workforce Recruitment Plan with current</li> </ul>	<ul style="list-style-type: none"> <li>Once a year during the operational phase.</li> </ul>	<ul style="list-style-type: none"> <li>Environmental Manager/ Officer</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		12.36.3. Actively use the database of PAP and their relevant skills and experience to guide local employment 12.36.4. Implement the Stakeholder Engagement Plan	recruitment practices, as well as cross-referencing employed personnel with PAP database; ▪ Verify that Stakeholder Engagement Plan is being implemented with written proof of such engagement with the PAP.		
12.37. Outsiders moves into the Kenhardt area	Limit incidences of in social deviance in the Kenhardt area.	12.37.1. Implement the Workforce Recruitment Plan 12.37.2. Ensure employment is reserved, where practical, for local residents 12.37.3. Actively use the database of PAP and their relevant skills and experience to guide local employment 12.37.4. Implement the Stakeholder Engagement Plan	▪ Verify that local labour is, as far as practically possible, being used, by cross-referencing the Workforce Recruitment Plan with current recruitment practices, as well as cross-referencing employed personnel with PAP database; ▪ Verify that Stakeholder Engagement Plan is being implemented with written proof of such engagement with the PAP.	▪ Once a year during the operational phase.	▪ Environmental Manager/ Officer
12.38. Expectations created regarding possible employment	Prevent frustration resulting from miscommunication of employment opportunities and project-related benefits in the local community.	12.38.1. Implement the Stakeholder Engagement Plan	▪ Verify that Stakeholder Engagement Plan is being implemented with written proof of such engagement with the PAP.	▪ Once a year during the operational phase.	▪ Environmental Manager/ Officer
12.39. Local spending	Ensure the generation of socio-economic benefits as a result of the multiplier effect.	12.39.1. Procure goods and services, where practical, within the study area 12.39.2. Obtain regularly required goods and services from as large a selection of local service providers as possible	▪ Verify purchase of local goods and services through proof of purchase.	▪ Once a year during the operational phase.	▪ Environmental Manager/ Officer
12.40. Local employment	Ensure optimum employment creation while taking cognizance of the local levels of experience and education.	12.40.1. Implement the Workforce Recruitment Plan	▪ Verify that local labour is, as far as practically possible, being used, by cross-referencing the Workforce Recruitment Plan with current recruitment practices, as well as cross-referencing employed personnel with PAP database.	▪ Once a year during the operational phase.	▪ Environmental Manager/ Officer

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
12.41. Economic Development Plan	Ensure contribution to local employment, local spending and human capacity development is being made.	12.41.1. Implement the Economic Development Plan	<ul style="list-style-type: none"> <li>Verify that the Economic development Plan is being implemented.</li> </ul>	<ul style="list-style-type: none"> <li>Once a year during the operational phase.</li> </ul>	<ul style="list-style-type: none"> <li>Environmental Manager/ Officer</li> </ul>
<b>C.6. GEOHYDROLOGY IMPACTS</b>					
12.42. Potential impact on groundwater as a result of stormwater outflows	To prevent unnecessary infiltration of polluted storm water	12.42.1. Ensure the storm water runoff is not contaminated. All reasonable measures must be taken to prevent the contamination of storm water outflows	<ul style="list-style-type: none"> <li>Monitor the quality of the storm water. Facility Manager to verify that measures are in place to reduce the contamination of storm water and to monitor the quality of storm water by undertaking site visits and visual inspections.</li> </ul>	<ul style="list-style-type: none"> <li>If possible do this during or shortly after a storm event, at the start of the rain season.</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> </ul>
12.43. Potential impact on groundwater quality as a result of accidental oil spillages or fuel leakages.	To reduce the potential of groundwater pollution.	<p>12.43.1. Avoid using old or damaged equipment and vehicles and ensure that they are well maintained and regularly serviced in order to ensure no leakages.</p> <p>12.43.2. Any engines that stand in one place for an excessive length of time, must have drip trays, fuel storage tanks should be above ground on an impermeable surface (within a bunded area) and vehicles and equipment should also be refuelled on an impermeable surface. A designated area should be established at the PV facility for refuelling activities and drip trays or similar impervious materials must be used during these procedures. If liquid product is being transported it must be ensured this does not spill during transit.</p> <p>12.43.3. If spillages occur during refuelling, they should be contained and removed as rapidly as possible, with correct disposal of the spilled material. Proof of disposal (waste disposal slips or waybills) should be obtained and retained on file for auditing purposes. During the operational phase, the same principles should be adhered to. Emergency measures and plans must be put in place and rehearsed in order to prepare for accidental</p>	<ul style="list-style-type: none"> <li>Vehicles need to be monitored throughout the operational phase. Monitor via site audits and record non-compliance and incidents.</li> <li>Monitor the placement and designation of the area for refuelling at the site camp via visual inspections. Monitor the usage of spill containment measures and record and report non-compliance.</li> <li>Monitor the refuelling/ servicing process and record the occurrence of any spillages.</li> </ul>	<ul style="list-style-type: none"> <li>Monthly operations. during</li> <li>Weekly</li> <li>Weekly</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> <li>Project Developer (Scatec Solar)</li> <li>Project Developer (Scatec Solar)</li> </ul>



## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		spillage.			
<b>C.7. WASTE MANAGEMENT</b>					
12.44. Pollution of the surrounding environment as a result of the handling, temporary storage and disposal of solid waste (general and hazardous).	Reduce soil and groundwater contamination as a result of incorrect storage, handling and disposal of general and hazardous waste.	12.44.1. Sufficient waste collection bins and skips (or similar) should be provided at the PV facility. Waste collection bins and skips should be covered with suitable material and correctly labelled, and should be kept in a designated, demarcated area, where access control is monitored and managed.	<ul style="list-style-type: none"> <li>▪ Monitor waste generation and collection throughout the operational phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager</li> </ul>
		12.44.2. Segregation of hazardous waste from general waste to be in place. Waste separation is encouraged and therefore receptacles should be labelled to reflect the different waste types.	<ul style="list-style-type: none"> <li>▪ On-site inspection of waste segregation.</li> <li>▪ Control of waste management practices throughout operational phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Weekly</li> <li>▪ Weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager</li> <li>▪ Facility Manager</li> </ul>
		12.44.3. General waste and hazardous waste should be removed from the site on a regular basis and disposed of at an appropriate, licenced waste disposal facility. Hazardous waste should be removed by an approved waste management Contractor. General solid waste could be removed from the site by municipal services. Waste disposal slips or waybills should be kept on file for auditing purposes as proof of disposal, as applicable	<ul style="list-style-type: none"> <li>▪ Inspection of the waste storage area.</li> <li>▪ Monitor via site audits and record non-compliance and incidents. Facility Manager to monitor and audit disposal slips.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily</li> <li>▪ Monthly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager</li> </ul>
		12.44.4. Ensure that the PV facility is kept clean at all times and that operational personnel are made aware of correct waste disposal methods.	<ul style="list-style-type: none"> <li>▪ Conduct training for all operational personnel.</li> <li>▪ Monitor the state of PV facility via site audits and record non-compliance and incidents.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once-off during operations and ensure that all new staff are inducted.</li> <li>▪ Daily</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager</li> </ul>
		12.44.5. No solid waste may be burned or buried on site.	<ul style="list-style-type: none"> <li>▪ Monitor via site audits and record non-compliance and incidents.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager</li> </ul>
		12.44.6. Waste amounts shall be recorded on a monthly basis.	<ul style="list-style-type: none"> <li>▪ Waste amounts to be documented.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monthly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Facility Manager</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		12.44.7. All operational waste (concrete, steel, rubbles etc.) to be removed from the site and waste hierarchy of prevention, as the preferred option, followed by reuse, recycling, recovery must be implemented, where possible.	<ul style="list-style-type: none"> <li>Waste removal and disposal to be monitored</li> </ul>	<ul style="list-style-type: none"> <li>Monthly</li> </ul>	<ul style="list-style-type: none"> <li>Facility Manager</li> </ul>
		12.44.8. Other non-hazardous solid waste (e.g. packaging material) to be disposed of at a licensed landfill.	<ul style="list-style-type: none"> <li>Waste removal and disposal to be monitored</li> </ul>	<ul style="list-style-type: none"> <li>Monthly</li> </ul>	<ul style="list-style-type: none"> <li>Facility Manager</li> </ul>
		12.44.9. All liquid waste (used oil, paints, lubricating compounds and grease) to be packaged and disposed of by appropriate means.	<ul style="list-style-type: none"> <li>Waste removal and disposal to be monitored</li> </ul>	<ul style="list-style-type: none"> <li>Monthly</li> </ul>	<ul style="list-style-type: none"> <li>Facility Manager</li> </ul>
		12.44.10. Adequate containers for the cleaning of equipment and materials (paint, solvent) must be provided as to avoid spillages.	<ul style="list-style-type: none"> <li>Waste removal and disposal to be monitored</li> </ul>	<ul style="list-style-type: none"> <li>Monthly</li> </ul>	<ul style="list-style-type: none"> <li>Facility Manager</li> </ul>
		12.44.11. Waste water from operations and painting activities must be collected in a designated container and disposed of at a suitable disposal point off site.	<ul style="list-style-type: none"> <li>Waste removal and disposal to be monitored</li> </ul>	<ul style="list-style-type: none"> <li>Monthly</li> </ul>	<ul style="list-style-type: none"> <li>Facility Manager</li> </ul>
<b>D. DECOMMISSIONING PHASE</b>					
<b>D.1. ECOLOGICAL IMPACTS (TERRESTRIAL, AQUATIC AND AVIFAUNA)</b>					
12.45. Exotic weed invasion of abandoned site resulting in ecological change	To prevent the excessive growth and propagation of exotic weeds on disturbed lands that formed portion of the PV facility	12.45.1. Exotic weed control measures to be instituted through weed control programme. 12.45.2. Regular redress of exotic weed through use of herbicide and manual removal.	<ul style="list-style-type: none"> <li>Compile weed eradication programme for period of 12 months post the decommissioning exercise.</li> <li>Appoint contractor to undertake weed eradication programme.</li> </ul>	<ul style="list-style-type: none"> <li>Weed eradication exercise to be undertaken every 6 months for a period of 12 months following decommissioning</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer (Scatec Solar)</li> </ul>
<b>D.2. VISUAL IMPACTS</b>					
12.46. Potential visual intrusion of decommissioning activities on existing views of sensitive visual receptors.	Prevent unnecessary visual clutter and focusing attention of surrounding visual receptors on the proposed development.	12.46.1. Disturbed and transformed areas should be contoured to approximate naturally occurring slopes to avoid lines and forms that will contrast with the existing landscapes. 12.46.2. Edges of re-vegetated areas should be feathered to reduce form and line contrasts with surrounding undisturbed landscape.	<ul style="list-style-type: none"> <li>Conduct visual inspections to ensure that landscaping is following the rehabilitation plan.</li> </ul>	<ul style="list-style-type: none"> <li>Weekly</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		12.46.3. Stockpiled topsoil should be reapplied to disturbed areas and these areas should be re-vegetated using a mix of indigenous species in such a way that the areas will form as little contrast in form, line, colour and texture with the surrounding undisturbed landscape.	<ul style="list-style-type: none"> <li>Site visits to ensure that stockpiled topsoil (or appropriate soil for vegetation when stockpiled topsoil is exhausted) is used.</li> </ul>	<ul style="list-style-type: none"> <li>Weekly</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> </ul>
		12.46.4. Night lighting of decommissioning sites should be minimised within requirements of safety and efficiency.	<ul style="list-style-type: none"> <li>Complaints about night lights should be investigated and documented in a register.</li> </ul>	<ul style="list-style-type: none"> <li>Weekly or bi-weekly</li> </ul>	<ul style="list-style-type: none"> <li>Contractor and ECO</li> </ul>
		12.46.5. Working at night should be avoided where possible.	<ul style="list-style-type: none"> <li>Operation times for decommissioning activities to be monitored and managed (as well as included in the tender contract).</li> </ul>	<ul style="list-style-type: none"> <li>Weekly</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> </ul>
	Reduce the visual impact of decommissioning activities project wide.	12.46.6. Maintain good housekeeping on site to avoid litter and minimize waste.	<ul style="list-style-type: none"> <li>Carry out site visits and inspections of the sites and ensure good housekeeping is maintained. Record and report any non-compliance.</li> <li>Carry out site visits and record and report any non-compliance.</li> <li>Complaints about night lights should be investigated and documented in a register. Investigate any complaints about night lights and document it in a register.</li> <li>Visit sites requiring rehabilitation.</li> <li>Carry out site visits and record and report any non-compliance.</li> <li>Carry out site visits and record and report any non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>Daily</li> <li>Daily</li> <li>Daily and as complaints arise.</li> <li>Daily</li> <li>Daily</li> <li>Daily</li> </ul>	<ul style="list-style-type: none"> <li>Construction Manager and ECO</li> </ul>
		12.46.7. Monitor sites for strict adherence to demarcated boundaries.			
		12.46.8. Monitor adherence to lighting plan.			
12.46.9. Monitor adherence to rehabilitation plan.					
	12.46.10. Monitor adherence to erosion control plan.				
	12.46.11. Monitor adherence to dust and fire control plans.				
<b>D.3. HERITAGE IMPACTS (ARCHAEOLOGY AND CULTURAL LANDSCAPE)</b>					
12.47. Construction vehicles and activities could result in damage to or destruction of archaeological sites	Minimise the chances of significant archaeological sites and/or graves being disturbed.	12.47.1. Ensure that no activity takes place outside of the authorized construction footprint.	<ul style="list-style-type: none"> <li>Carry out visual inspections to ensure strict control over the behaviour of construction staff in order to restrict activities to within demarcated areas.</li> </ul>	<ul style="list-style-type: none"> <li>Weekly</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
and/or graves.					
12.48. Scarring of the landscape once infrastructure has been removed.	Ensure that the landscape within the development footprint has a similar appearance to that around it.	12.48.1. Ensure removal of all foundations, construction materials and foreign matter. 12.48.2. Ensure rehabilitation of the site in accordance with environmental guidelines.	<ul style="list-style-type: none"> <li>▪ Follow the relevant environmental guidelines.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Throughout the decommissioning phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> </ul>
<b>D.4. SOILS AND AGRICULTURAL POTENTIAL IMPACTS</b>					
12.49. Degradation of veld vegetation beyond the direct footprint of the proposed PV facility due to decommissioning disturbance and potential trampling by vehicles	To conserve the surrounding natural veld vegetation.	12.49.1. Minimize footprint of disturbance during the decommissioning phase and ensure that work is undertaken within the demarcated area only. 12.49.2. Confine vehicle access on roads only 12.49.3. Control dust generation during decommissioning activities by implementing standard construction site dust control measures (dampening with water) where required. Because of water scarcity, this should only be done where and when dust generation is a significant problem.	<ul style="list-style-type: none"> <li>▪ Monitor the decommissioning activities via site audits to ensure that they are undertaken within the demarcated decommissioning area, and record non-compliance and incidents.</li> <li>▪ Include periodic site inspection in environmental performance reporting that specifically records occurrence or not of off-road vehicle tracks surrounding the site. Monitor via site audits and record non-compliance and incidents.</li> <li>▪ Monitor dust suppression mechanisms via visual inspections and record non-compliances. Maintain an incidents/complaints register. The date, time, nature of complaint, name of complainant and corrective actions must be logged for all complaints. Complaints must be investigated and, if appropriate, acted upon.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Daily</li> <li>▪ Monthly during the decommissioning phase</li> <li>▪ Monthly and during complaints/incidents</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor and ECO</li> <li>▪ ECO</li> <li>▪ Contractor and ECO</li> </ul>
12.50. Loss of topsoil due to poor topsoil management	Ensure effective topsoil covering to conserve soil fertility on all disturbed areas, after they have been rehabilitated.	12.50.1. Strip and stockpile topsoil from all areas where soil (below surface) will be disturbed. 12.50.2. After cessation of disturbance, re-spread topsoil over the surface. 12.50.3. Dispose of any sub-surface spoils from excavations where they will not impact on land that supports vegetation, or where they can be effectively covered with topsoil.	<ul style="list-style-type: none"> <li>▪ Establish an effective record keeping system for each area where soil is disturbed for decommissioning purposes. These records should be included in environmental performance reports, and should include all the records below:                             <ul style="list-style-type: none"> <li>○ Record the GPS coordinates of each area.</li> <li>○ Record the date of topsoil stripping.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ As needed, dependent on the specifics of decommissioning activities.</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
			<ul style="list-style-type: none"> <li>○ Record the GPS coordinates of where the topsoil is stockpiled.</li> <li>○ Record the date of cessation of decommissioning activities at the particular site.</li> <li>○ Photograph the area on cessation of decommissioning activities.</li> <li>○ Record date and depth of re-spreading of topsoil.</li> <li>○ Photograph the area on completion of rehabilitation and on an annual basis thereafter to show vegetation establishment and evaluate progress of restoration over time.</li> </ul>		
12.51. Soil erosion due to alteration of the land surface characteristics	To reduce erosion on site and downstream of the site as a result of run-off from the site, or due to wind erosion.	12.51.1. Implement an effective system of run-off control, where it is required, that collects and safely disseminates run-off water from all hardened surfaces and prevents potential down slope erosion.	<ul style="list-style-type: none"> <li>▪ Include periodic site inspection in environmental performance reporting that inspects the effectiveness and integrity of the run-off control system and specifically records the occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Monthly during the decommissioning phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> </ul>
<b>D.5. SOCIAL IMPACTS</b>					
12.52. Decommissioning of the proposed development	Minimize job losses	<p>12.52.1. The proponent should comply with relevant South African labour legislation when retrenching employees.</p> <p>12.52.2. Scatec Solar must implement appropriate succession training of locally employed staff earmarked for retrenchment during decommissioning.</p> <p>12.52.3. All project infrastructures should be decommissioned appropriately and thoroughly to avoid misuse.</p>	<ul style="list-style-type: none"> <li>▪ Verify that retrenchment practices are compliant with south African labour legislation</li> <li>▪ Verify that Scatec implemented succession training of locally employed staff before the plant is decommissioned</li> <li>▪ Verify that decommissioned infrastructure does not pose any significant risk to the environment or the people living in the environment.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Once-off during the decommissioning phase (for mitigation measures (12.53.1) and (12.53.2) and once-off after decommissioning is completed (for mitigation measure (12.53.3)).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor and ECO</li> </ul>
<b>D.6. GEOHYDROLOGY IMPACTS</b>					

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
12.53. Potential impact on groundwater quality as a result of accidental oil spillages or fuel leakages.	To reduce the potential of groundwater pollution.	<p>12.53.1. Avoid using old or damaged equipment and vehicles and ensure that they are well maintained and regularly serviced in order to ensure no leakages.</p> <p>12.53.2. Any engines that stand in one place for an excessive length of time, must have drip trays, fuel storage tanks should be above ground on an impermeable surface (within a bunded area) and vehicles and equipment should also be refuelled on an impermeable surface. A designated area should be established at the site camp for refuelling activities and drip trays or similar impervious materials must be used during these procedures. If liquid product is being transported it must be ensured this does not spill during transit.</p> <p>12.53.3. If spillages occur during refuelling, they should be contained and removed as rapidly as possible, with correct disposal of the spilled material. Proof of disposal (waste disposal slips or waybills) should be obtained and retained on file for auditing purposes. During the operational phase, the same principles should be adhered to. Emergency measures and plans must be put in place and rehearsed in order to prepare for accidental spillage.</p>	<ul style="list-style-type: none"> <li>▪ Vehicles need to be monitored throughout the decommissioning phase. Monitor via site audits and record non-compliance and incidents.</li> <li>▪ Monitor the placement and designation of the area for refuelling at the site camp via visual inspections. Monitor the usage of spill containment measures and record and report non-compliance.</li> <li>▪ Monitor the refuelling/ servicing process and record the occurrence of any spillages.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Four times per annum for the decommissioning period, i.e. at 3 months, 6 months, 9 months and 12 months.</li> <li>▪ Weekly</li> <li>▪ Weekly</li> </ul>	<ul style="list-style-type: none"> <li>▪ Project Developer and ECO.</li> <li>▪ Project Developer (Scatec Solar) and ECO</li> <li>▪ Project Developer (Scatec Solar) and ECO</li> </ul>
<b>D.7. WASTE MANAGEMENT</b>					
12.54. Generation of waste due to disassembly of the solar facility.	Avoid substantial negative impacts at the decommissioning phase due to insufficient planning.	12.54.1. Suitable receptacles must be provided for the temporary storage of various waste types such as scrap metal and concrete, until it is removed to the nearest licensed landfill.	<ul style="list-style-type: none"> <li>▪ Audit the implementation of mitigation measures recommended for the decommissioning phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ During the decommissioning phase</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> </ul>
		12.54.2. Waste separation is encouraged and therefore receptacles should be labelled to reflect the different waste types.	<ul style="list-style-type: none"> <li>▪ Audit the implementation of mitigation measures recommended for the decommissioning phase.</li> </ul>	<ul style="list-style-type: none"> <li>▪ During the decommissioning phase</li> </ul>	<ul style="list-style-type: none"> <li>▪ ECO</li> </ul>

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

### 8. APPENDIX A – PRE-APPROVED GAZETTED GENERIC EMPRS

#### PRE-APPROVED GENERIC EMPR TEMPLATE FOR OVERHEAD ELECTRICITY TRANSMISSION AND DISTRIBUTION INFRASTRUCTURE GOVERNMENT GAZETTE 42323, GOVERNMENT NOTICE 435

##### SECTION 5: IMPACT MANAGEMENT OUTCOMES AND IMPACT MANAGEMENT ACTIONS

This section provides a pre-approved generic EMPr template with aspects that are common to the development of overhead electricity transmission and distribution infrastructure. There is a list of aspects identified for the development or expansion of overhead electricity transmission and distribution infrastructure, and for each aspect a set of prescribed impact management outcomes and associated impact management actions have been identified. Holders of EAs are responsible to ensure the implementation of these outcomes and actions for all projects as a minimum requirement, in order to mitigate the impact of such aspects identified for the development or expansion of overhead electricity transmission and distribution infrastructure.

The template provided below is to be completed by providing the information under each heading for each environmental impact management action.

The completed template must be signed and dated on each page by both the contractor and the holder of the EA prior to commencement of the activity. The method statements prepared and agreed to by the holder of the EA must be appended to the template as Appendix 1. Each method statement must also be duly signed and dated on each page by the contractor and the holder of the EA. This template, once signed and dated, is legally binding. The holder of the EA will remain responsible for its implementation.

##### 5.1 Environmental awareness training

Impact management outcome: All onsite staff are aware and understands the individual responsibilities in terms of this EMPr.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– All staff must receive environmental awareness training prior to commencement of the activities;</li> <li>– The Contractor must allow for sufficient sessions to train all personnel with no more than 20 personnel attending each course;</li> <li>– Refresher environmental awareness training is available as and when required;</li> <li>– All staff are aware of the conditions and controls linked to the EA and within the EMPr and made aware of their individual roles and responsibilities in achieving compliance with the EA and EMPr;</li> <li>– The Contractor must erect and maintain information posters at key locations on site, and the posters must include the following information as a minimum:                             <ul style="list-style-type: none"> <li>a) Safety notifications; and</li> <li>b) No littering.</li> </ul> </li> <li>– Environmental awareness training must include as a minimum the following:                             <ul style="list-style-type: none"> <li>a) Description of significant environmental impacts, actual or potential, related to their work activities;</li> <li>b) Mitigation measures to be implemented when carrying out specific activities;</li> <li>c) Emergency preparedness and response procedures;</li> <li>d) Emergency procedures;</li> <li>e) Procedures to be followed when working near or within sensitive areas;</li> <li>f) Wastewater management procedures;</li> </ul> </li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact management outcome: All onsite staff are aware and understands the individual responsibilities in terms of this EMPr.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>g) Water usage and conservation;</li> <li>h) Solid waste management procedures;</li> <li>i) Sanitation procedures;</li> <li>j) Fire prevention; and</li> <li>k) Disease prevention.</li> </ul> <ul style="list-style-type: none"> <li>– A record of all environmental awareness training courses undertaken as part of the EMPr must be available;</li> <li>– Educate workers on the dangers of open and/or unattended fires;</li> <li>– A staff attendance register of all staff to have received environmental awareness training must be available.</li> <li>– Course material must be available and presented in appropriate languages that all staff can understand.</li> </ul>						

### 5.2. Site Establishment development

Impact management outcome: Impacts on the environment are minimised during site establishment and the development footprint are kept to demarcated development area.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– A method statement must be provided by the contractor prior to any onsite activity that includes the layout of the construction camp in the form of a plan showing the location of key infrastructure and services (where applicable), including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous materials storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management;</li> <li>– Location of camps must be within approved area to ensure that the site does not impact on sensitive areas identified in the environmental assessment or site walk through;</li> <li>– Sites must be located where possible on previously disturbed areas;</li> <li>– The camp must be fenced in accordance with <i>Section 5.5: Fencing and gate installation</i>; and</li> <li>– The use of existing accommodation for contractor staff, where possible, is encouraged.</li> </ul>						

### 5.3. Access restricted areas

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## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact management outcome: Access to restricted areas prevented.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Identification of access restricted areas is to be informed by the environmental assessment, site walk through and any additional areas identified during development;</li> <li>- Erect, demarcate and maintain a temporary barrier with clear signage around the perimeter of any access restricted area, colour coding could be used if appropriate; and</li> <li>- Unauthorised access and development related activity inside access restricted areas is prohibited.</li> </ul>						

### 5.4. Access roads

Impact management outcome: Minimise impact to the environment through the planned and restricted movement of vehicles on site.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Access to the servitude and tower positions must be negotiated with the relevant landowner and must fall within the assessed and authorised area;</li> <li>- An access agreement must be formalised and signed by the DPM, Contractor and landowner before commencing with the activities;</li> <li>- The access roads to tower positions must be signposted after access has been negotiated and before the commencement of the activities;</li> <li>- All private roads used for access to the servitude must be maintained and upon completion of the works, be left in at least the original condition</li> <li>- All contractors must be made aware of all these access routes.</li> <li>- Any access route deviation from that in the written agreement must be closed and re-vegetated immediately, at the contractor's expense;</li> <li>- Maximum use of both existing servitudes and existing roads must be made to minimize further disturbance through the development of new roads;</li> <li>- In circumstances where private roads must be used, the condition of the said roads must be recorded in accordance with <i>section 4.9: photographic record</i>; prior to use and the condition thereof agreed by the landowner, the DPM, and the contractor;</li> <li>- Access roads in flattish areas must follow fence lines and tree belts to avoid fragmentation of vegetated areas or croplands</li> <li>- Access roads must only be developed on pre-planned and approved roads.</li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

### 5.5. Fencing and Gate installation

Impact management outcome: Minimise impact to the environment and ensure safe and controlled access to the site through the erection of fencing and gates where required.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Use existing gates provided to gain access to all parts of the area authorised for development, where possible;</li> <li>- Existing and new gates to be recorded and documented in accordance with section 4.9: <i>photographic record</i>;</li> <li>- All gates must be fitted with locks and be kept locked at all times during the development phase, unless otherwise agreed with the landowner;</li> <li>- At points where the line crosses a fence in which there is no suitable gate within the extent of the line servitude, on the instruction of the DPM, a gate must be installed at the approval of the landowner;</li> <li>- Care must be taken that the gates must be so erected that there is a gap of no more than 100 mm between the bottom of the gate and the ground;</li> <li>- Where gates are installed in jackal proof fencing, a suitable reinforced concrete sill must be provided beneath the gate;</li> <li>- Original tension must be maintained in the fence wires;</li> <li>- All gates installed in electrified fencing must be re-electrified;</li> <li>- All demarcation fencing and barriers must be maintained in good working order for the duration of overhead transmission and distribution electricity infrastructure development activities;</li> <li>- Fencing must be erected around the camp, batching plants, hazardous storage areas, and all designated access restricted areas, where appropriate and would not cause harm to the sensitive flora;</li> <li>- Any temporary fencing to restrict the movement of life-stock must only be erected with the permission of the land owner.</li> <li>- All fencing must be developed of high quality material bearing the SABS mark;</li> <li>- The use of razor wire as fencing must be avoided;</li> <li>- Fenced areas with gate access must remain locked after hours, during weekends and on holidays if staff is away from site. Site security will be required at all times;</li> <li>- On completion of the development phase all temporary fences are to be removed;</li> <li>- The contractor must ensure that all fence uprights are appropriately removed, ensuring that no uprights are cut at ground level but rather removed completely.</li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

### 5.6. Water Supply Management

Impact management outcome: Undertake responsible water usage.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All abstraction points or bore holes must be registered with the DWS and suitable water meters installed to ensure that the abstracted volumes are measured on a daily basis;</li> <li>- The Contractor must ensure the following:                             <ul style="list-style-type: none"> <li>a. The vehicle abstracting water from a river does not enter or cross it and does not operate from within the river;</li> <li>b. No damage occurs to the river bed or banks and that the abstraction of water does not entail stream diversion activities; and</li> <li>c. All reasonable measures to limit pollution or sedimentation of the downstream watercourse are implemented.</li> </ul> </li> <li>- Ensure water conservation is being practiced by:                             <ul style="list-style-type: none"> <li>a. Minimising water use during cleaning of equipment;</li> <li>b. Undertaking regular audits of water systems; and</li> <li>c. Including a discussion on water usage and conservation during environmental awareness training.</li> <li>d. The use of grey water is encouraged.</li> </ul> </li> </ul>						

### 5.7. Storm and waste water management

Impact management outcome: Impacts to the environment caused by storm water and wastewater discharges during construction are avoided.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Runoff from the cement/ concrete batching areas must be strictly controlled, and contaminated water must be collected, stored and either treated or disposed of off-site, at a location approved by the project manager;</li> <li>- All spillage of oil onto concrete surfaces must be controlled by the use of an approved absorbent material and the used absorbent material disposed of at an appropriate waste disposal facility;</li> <li>- Natural storm water runoff not contaminated during the development and clean water can be discharged directly to watercourses and water bodies, subject to the Project Manager's approval and support by the ECO;</li> <li>- Water that has been contaminated with suspended solids, such as soils and silt, may be released into watercourses or water bodies only once all suspended solids have been removed from the water by settling out these solids in settlement ponds. The release of settled water back into the environment must be subject to the Project Manager's approval and support by the ECO.</li> </ul>						

### 5.8. Solid and hazardous waste management

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact management outcome: Waste is appropriately stored, handled and safely disposed of at a recognised waste facility.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All measures regarding waste management must be undertaken using an integrated waste management approach;</li> <li>- Sufficient, covered waste collection bins (scavenger and weatherproof) must be provided;</li> <li>- A suitably positioned and clearly demarcated waste collection site must be identified and provided;</li> <li>- The waste collection site must be maintained in a clean and orderly manner;</li> <li>- Waste must be segregated into separate bins and clearly marked for each waste type for recycling and safe disposal;</li> <li>- Staff must be trained in waste segregation;</li> <li>- Bins must be emptied regularly;</li> <li>- General waste produced onsite must be disposed of at registered waste disposal sites/ recycling company;</li> <li>- Hazardous waste must be disposed of at a registered waste disposal site;</li> <li>- Certificates of safe disposal for general, hazardous and recycled waste must be maintained.</li> </ul>						

### 5.9. Protection of watercourses and estuaries

Impact management outcome: Pollution and contamination of the watercourse environment and or estuary erosion are prevented.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All watercourses must be protected from direct or indirect spills of pollutants such as solid waste, sewage, cement, oils, fuels, chemicals, aggregate tailings, wash and contaminated water or organic material resulting from the Contractor's activities;</li> <li>- In the event of a spill, prompt action must be taken to clear the polluted or affected areas;</li> <li>- Where possible, no development equipment must traverse any seasonal or permanent wetland</li> <li>- No return flow into the estuaries must be allowed and no disturbance of the Estuarine Functional Zone should occur;</li> <li>- Development of permanent watercourse or estuary crossing must only be undertaken where no alternative access to tower position is available;</li> <li>- There must not be any impact on the long term morphological dynamics of watercourses or estuaries;</li> <li>- Existing crossing points must be favored over the creation of new crossings (including temporary access)</li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact management outcome: Pollution and contamination of the watercourse environment and or estuary erosion are prevented.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- When working in or near any watercourse or estuary, the following environmental controls and consideration must be taken:               <ul style="list-style-type: none"> <li>a) Water levels during the period of construction;</li> <li>b) No altering of the bed, banks, course or characteristics of a watercourse</li> <li>c) During the execution of the works, appropriate measures to prevent pollution and contamination of the riparian environment must be implemented e.g. including ensuring that construction equipment is well maintained;</li> <li>d) Where earthwork is being undertaken in close proximity to any watercourse, slopes must be stabilised using suitable materials, i.e. sandbags or geotextile fabric, to prevent sand and rock from entering the channel; and</li> <li>e) Appropriate rehabilitation and re-vegetation measures for the watercourse banks must be implemented timeously. In this regard, the banks should be appropriately and incrementally stabilised as soon as development allows.</li> </ul> </li> </ul>						

### 5.10. Vegetation clearing

Impact management outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
General: <ul style="list-style-type: none"> <li>- Indigenous vegetation which does not interfere with the development must be left undisturbed;</li> <li>- Protected or endangered species may occur on or near the development site. Special care should be taken not to damage such species;</li> <li>- Search, rescue and replanting of all protected and endangered species likely to be damaged during project development must be identified by the relevant specialist and completed prior to any development or clearing;</li> <li>- Permits for removal must be obtained from the Department of Agriculture, Forestry and Fisheries prior to the cutting or clearing of the affected species, and they must be filed;</li> <li>- The Environmental Audit Report must confirm that all identified species have been rescued and replanted and that the location of replanting is compliant with conditions of approvals;</li> <li>- Trees felled due to construction must be documented and form part of the Environmental Audit Report;</li> <li>- Rivers and watercourses must be kept clear of felled trees, vegetation cuttings and debris;</li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact management outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Only a registered pest control operator may apply herbicides on a commercial basis and commercial application must be carried out under the supervision of a registered pest control operator, supervision of a registered pest control operator or is appropriately trained;</li> <li>- A daily register must be kept of all relevant details of herbicide usage;</li> <li>- No herbicides must be used in estuaries;</li> <li>- All protected species and sensitive vegetation not removed must be clearly marked and such areas fenced off in accordance to <i>Section 5.3: Access restricted areas</i>.</li> </ul> <p>Servitude:</p> <ul style="list-style-type: none"> <li>- Vegetation that does not grow high enough to cause interference with overhead transmission and distribution infrastructures, or cause a fire hazard to any plantation, must not be cut or trimmed unless it is growing in the road access area, and then only at the discretion of the Project Manager;</li> <li>- Where clearing for access purposes is essential, the maximum width to be cleared within the servitude must be in accordance to distance as agreed between the land owner and the EA holder</li> <li>- Alien invasive vegetation must be removed according to a plan (in line with relevant municipal and provincial procedures, guidelines and recommendations) and disposed of at a recognised waste disposal facility;</li> <li>- Vegetation must be trimmed where it is likely to intrude on the minimum vegetation clearance distance (MVCD) or will intrude on this distance before the next scheduled clearance. MVCD is determined from SANS 10280;</li> <li>- Debris resulting from clearing and pruning must be disposed of at a recognised waste disposal facility, unless the landowners wish to retain the cut vegetation;</li> <li>- In the case of the development of new overhead transmission and distribution infrastructures, a one metre "trace-line" must be cut through the vegetation for stringing purposes only and no vehicle access must be cleared along the "trace-line". Alternative methods of stringing which limit impact to the environment must always be considered.</li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

### 5.11. Protection of fauna

Impact management outcome: Minimise disturbance to fauna.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- No interference with livestock must occur without the landowner's written consent and with the landowner or a person representing the landowner being present;</li> <li>- The breeding sites of raptors and other wild birds species must be taken into consideration during the planning of the development programme;</li> <li>- Breeding sites must be kept intact and disturbance to breeding birds must be avoided. Special care must be taken where nestlings or fledglings are present;</li> <li>- Nesting sites on existing parallel lines must be documented;</li> <li>- Special recommendations of the avian specialist must be adhered to at all times to prevent unnecessary disturbance of birds;</li> <li>- Bird guards and diverters must be installed on the new line as per the recommendations of the specialist;</li> <li>- No poaching must be tolerated under any circumstances. All animal dens in close proximity to the works areas must be marked as Access restricted areas;</li> <li>- No deliberate or intentional killing of fauna is allowed;</li> <li>- In areas where snakes are abundant, snake deterrents to be deployed on the pylons to prevent snakes climbing up, being electrocuted and causing power outages; and</li> <li>- No Threatened or Protected species (ToPs) and/or protected fauna as listed according NEMBA (Act No. 10 of 2004) and relevant provincial ordinances may be removed and/or relocated without appropriate authorisations/permits.</li> </ul>						

### 5.12. Protection of heritage resources

Impact management outcome: Minimise impact to heritage resources.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Identify, demarcate and prevent impact to all known sensitive heritage features on site in accordance with the No-Go procedure in <i>Section 5.3: Access restricted areas</i>;</li> <li>- Carry out general monitoring of excavations for potential fossils, artefacts and material of heritage importance;</li> <li>- All work must cease immediately, if any human remains and/or other archaeological, palaeontological and historical material are uncovered. Such material, if exposed, must be reported to the nearest museum, archaeologist/palaeontologist (or the South African Police Services), so that a systematic and professional investigation can be undertaken. Sufficient time must be allowed to remove/collect such material before development recommences.</li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

### 5.13. Safety of the public

Impact management outcome: All precautions are taken to minimise the risk of injury, harm or complaints.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Identify fire hazards, demarcate and restrict public access to these areas as well as notify the local authority of any potential threats e.g. large brush stockpiles, fuels etc.;</li> <li>- All unattended open excavations must be adequately fenced or demarcated;</li> <li>- Adequate protective measures must be implemented to prevent unauthorised access to and climbing of partly constructed towers and protective scaffolding;</li> <li>- Ensure structures vulnerable to high winds are secured;</li> <li>- Maintain an incidents and complaints register in which all incidents or complaints involving the public are logged.</li> </ul>						

### 5.14. Sanitation

Impact management outcome: Clean and well maintained toilet facilities are available to all staff in an effort to minimise the risk of disease and impact to the environment.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Mobile chemical toilets are installed onsite if no other ablution facilities are available;</li> <li>- The use of ablution facilities and or mobile toilets must be used at all times and no indiscriminate use of the veld for the purposes of ablutions must be permitted under any circumstances;</li> <li>- Where mobile chemical toilets are required, the following must be ensured:               <ul style="list-style-type: none"> <li>a) Toilets are located no closer than 100 m to any watercourse or water body;</li> <li>b) Toilets are secured to the ground to prevent them from toppling due to wind or any other cause;</li> <li>c) No spillage occurs when the toilets are cleaned or emptied and the contents are managed in accordance with the EMPr;</li> <li>d) Toilets have an external closing mechanism and are closed and secured from the outside when not in use to prevent toilet paper from being blown out;</li> <li>e) Toilets are emptied before long weekends and workers holidays, and must be locked after working hours;</li> <li>f) Toilets are serviced regularly and the ECO must inspect toilets to ensure compliance to health standards;</li> </ul> </li> <li>- A copy of the waste disposal certificates must be maintained.</li> </ul>						

### 5.15. Prevention of disease

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## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact Management outcome: All necessary precautions linked to the spread of disease are taken.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Undertake environmentally-friendly pest control in the camp area;</li> <li>- Ensure that the workforce is sensitised to the effects of sexually transmitted diseases, especially HIV AIDS;</li> <li>- The Contractor must ensure that information posters on AIDS are displayed in the Contractor Camp area;</li> <li>- Information and education relating to sexually transmitted diseases to be made available to both construction workers and local community, where applicable;</li> <li>- Free condoms must be made available to all staff on site at central points;</li> <li>- Medical support must be made available;</li> <li>- Provide access to Voluntary HIV Testing and Counselling Services.</li> </ul>						

### 5.16. Emergency procedures

Impact management outcome: Emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Compile an Emergency Response Action Plan (ERAP) prior to the commencement of the proposed project;</li> <li>- The Emergency Plan must deal with accidents, potential spillages and fires in line with relevant legislation;</li> <li>- All staff must be made aware of emergency procedures as part of environmental awareness training;</li> <li>- The relevant local authority must be made aware of a fire as soon as it starts;</li> <li>- In the event of emergency necessary mitigation measures to contain the spill or leak must be implemented (see <i>Hazardous Substances section 5.17</i>).</li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

### 5.17. Hazardous substances

Impact management outcome: Safe storage, handling, use and disposal of hazardous substances.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- The use and storage of hazardous substances to be minimised and non-hazardous and non-toxic alternatives substituted where possible;</li> <li>- All hazardous substances must be stored in suitable containers as defined in the Method Statement;</li> <li>- Containers must be clearly marked to indicate contents, quantities and safety requirements;</li> <li>- All storage areas must be bunded. The bunded area must be of sufficient capacity to contain a spill / leak from the stored containers;</li> <li>- Bunded areas to be suitably lined with a SABS approved liner;</li> <li>- An Alphabetical Hazardous Chemical Substance (HCS) control sheet must be drawn up and kept up to date on a continuous basis;</li> <li>- All hazardous chemicals that will be used on site must have Material Safety Data Sheets (MSDS);</li> <li>- All employees working with HCS must be trained in the safe use of the substance and according to the safety data sheet;</li> <li>- Employees handling hazardous substances / materials must be aware of the potential impacts and follow appropriate safety measures. Appropriate personal protective equipment must be made available;</li> <li>- The Contractor must ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks or in bowsers;</li> <li>- The tanks/ bowsers must be situated on a smooth impermeable surface (concrete) with a permanent bund. The impermeable lining must extend to the crest of the bund and the volume inside the bund must be 130% of the total capacity of all the storage tanks/ bowsers (110% statutory requirement plus an allowance for rainfall);</li> <li>- The floor of the bund must be sloped, draining to an oil separator;</li> <li>- Provision must be made for refueling at the storage area by protecting the soil with an impermeable groundcover. Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained;</li> <li>- All empty externally dirty drums must be stored on a drip tray or within a bunded area;</li> <li>- No unauthorised access into the hazardous substances storage areas must be permitted;</li> <li>- No smoking must be allowed within the vicinity of the hazardous storage areas;</li> <li>- Adequate fire-fighting equipment must be made available at all hazardous storage areas;</li> <li>- Where refueling away from the dedicated refueling station is required, a mobile refueling unit must be used. Appropriate ground protection such as drip trays must be used;</li> <li>- An appropriately sized spill kit kept onsite relevant to the scale of the activity/s involving the use of hazardous substance must be available at all times;</li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact management outcome: Safe storage, handling, use and disposal of hazardous substances.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- The responsible operator must have the required training to make use of the spill kit in emergency situations;</li> <li>- An appropriate number of spill kits must be available and must be located in all areas where activities are being undertaken;</li> <li>- In the event of a spill, contaminated soil must be collected in containers and stored in a central location and disposed of according to the National Environmental Management: Waste Act 59 of 2008. Refer to <i>Section 5.7</i> for procedures concerning <i>storm and waste water management</i> and <i>5.8</i> for <i>solid and hazardous waste management</i>.</li> </ul>						

### 5.18. Workshop, equipment maintenance and storage

Impact management outcome: Soil, surface water and groundwater contamination is minimised.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Where possible and practical all maintenance of vehicles and equipment must take place in the workshop area;</li> <li>- During servicing of vehicles or equipment, especially where emergency repairs are effected outside the workshop area, a suitable drip tray must be used to prevent spills onto the soil. The relevant local authority must be made aware of a fire as soon as it starts;</li> <li>- Leaking equipment must be repaired immediately or be removed from site to facilitate repair;</li> <li>- Workshop areas must be monitored for oil and fuel spills;</li> <li>- Appropriately sized spill kit kept onsite relevant to the scale of the activity taking place must be available;</li> <li>- The workshop area must have a bunded concrete slab that is sloped to facilitate runoff into a collection sump or suitable oil / water separator where maintenance work on vehicles and equipment can be performed;</li> <li>- Water drainage from the workshop must be contained and managed in accordance <i>Section 5.7: storm and waste water management</i>.</li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

### 5.19. Batching plants

Impact management outcome: Minimise spillages and contamination of soil, surface water and groundwater.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Concrete mixing must be carried out on an impermeable surface;</li> <li>– Batching plants areas must be fitted with a containment facility for the collection of cement laden water.</li> <li>– Dirty water from the batching plant must be contained to prevent soil and groundwater contamination</li> <li>– Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains;</li> <li>– A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted;</li> <li>– Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licenced disposal facility;</li> <li>– Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site;</li> <li>– Sand and aggregates containing cement must be kept damp to prevent the generation of dust (Refer to <i>Section 5.20: Dust emissions</i>)</li> <li>– Any excess sand, stone and cement must be removed or reused from site on completion of construction period and disposed at a registered disposal facility;</li> <li>– Temporary fencing must be erected around batching plants in accordance with <i>Section 5.5: Fencing and gate installation</i>.</li> </ul>						

### 5.20. Dust emissions

Impact management outcome: Dust prevention measures are applied to minimise the generation of dust.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Take all reasonable measures to minimise the generation of dust as a result of project development activities to the satisfaction of the ECO;</li> <li>– Removal of vegetation must be avoided until such time as soil stripping is required and similarly exposed surfaces must be re- vegetated or stabilised as soon as is practically possible;</li> <li>– Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present;</li> <li>– During high wind conditions, the ECO must evaluate the situation and make recommendations as to whether dust-damping measures are adequate, or whether working will cease altogether until the wind speed drops to an acceptable level;</li> <li>– Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind;</li> <li>– Where erosion of stockpiles becomes a problem, erosion control measures must be</li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact management outcome: Dust prevention measures are applied to minimise the generation of dust.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
implemented at the discretion of the ECO; – Vehicle speeds must not exceed 40 km/h along dust roads or 20 km/h when traversing unconsolidated and non-vegetated areas; – Straw stabilisation must be applied at a rate of one bale/10 m <sup>2</sup> and harrowed into the top 100 mm of top material, for all completed earthworks; – For significant areas of excavation or exposed ground, dust suppression measures must be used to minimise the spread of dust.						

### 5.21. Blasting

Impact management outcome: Impact to the environment is minimised through a safe blasting practice.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Any blasting activity must be conducted by a suitably licensed blasting contractor; and – Notification of surrounding landowners, emergency services site personnel of blasting activity 24 hours prior to such activity taking place on Site.						

### 5.22. Noise

Impact Management outcome: Unnecessary noise is prevented by ensuring that noise from construction activities is mitigated.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– The Contractor must keep noise level within acceptable limits, Restrict the use of sound amplification equipment for communication and emergency only; – All vehicles and machinery must be fitted with appropriate silencing technology and must be properly maintained; – Any complaints received by the Contractor regarding noise must be recorded and communicated. Where possible or applicable, provide transport to and from the site on a daily basis for construction workers; – Develop a Code of Conduct for the construction phase in terms of behaviour of construction staff. Operating hours as determined by the environmental authorisation are adhered to during the development phase. Where not defined, it must be ensured that development activities must still meet the						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

impact management outcome related to noise management.					
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### 5.23. Fire prevention

Impact management outcome: Prevention of uncontrollable fires.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Designate smoking areas where the fire hazard could be regarded as insignificant;</li> <li>- Firefighting equipment must be available on all vehicles located on site;</li> <li>- The local Fire Protection Agency (FPA) must be informed of construction activities;</li> <li>- Contact numbers for the FPA and emergency services must be communicated in environmental awareness training and displayed at a central location on site;</li> <li>- Two way swop of contact details between ECO and FPA.</li> </ul>						

### 5.24. Stockpiling and stockpile areas

Impact management outcome: Erosion and sedimentation as a result of stockpiling are reduced.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All material that is excavated during the project development phase (either during piling (if required) or earthworks) must be stored appropriately on site in order to minimise impacts to watercourses, watercourses and water bodies;</li> <li>- All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods;</li> <li>- Topsoil stockpiles must not exceed 2 m in height;</li> <li>- During periods of strong winds and heavy rain, the stockpiles must be covered with appropriate material (e.g. cloth, tarpaulin etc.);</li> <li>- Where possible, sandbags (or similar) must be placed at the bases of the stockpiled material in order to prevent erosion of the material.</li> </ul>						

### 5.25. Finalising tower positions

Impact management outcome: No environmental degradation occurs as a result of the survey and pegging operations.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- No vegetation clearing must occur during survey and pegging operations;</li> <li>- No new access roads must be developed to facilitate access for survey and pegging purposes;</li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

<ul style="list-style-type: none"> <li>- Project manager, botanical specialist and contractor to agree on final tower positions based on survey within assessed and approved areas;</li> <li>- The surveyor is to demarcate (peg) access roads/tracks in consultation with ECO. No deviations will be allowed without the prior written consent from the ECO.</li> </ul>					
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### 5.26. Excavation and Installation of foundations

Impact management outcome: No environmental degradation occurs as a result of excavation or installation of foundations.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All excess spoil generated during foundation excavation must be disposed of in an appropriate manner and at a recognised disposal site, if not used for backfilling purposes;</li> <li>- Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes;</li> <li>- Management of equipment for excavation purposes must be undertaken in accordance with <i>Section 5.18: Workshop equipment maintenance and storage</i>; and</li> <li>- Hazardous substances spills from equipment must be managed in accordance with <i>Section 5.17: Hazardous substances</i>.</li> <li>- Batching of cement to be undertaken in accordance with <i>Section 5.19 : Batching plants</i>;</li> <li>- Residual cement must be disposed of in accordance with <i>Section 5.8: Solid and hazardous waste management</i>.</li> </ul>						

### 5.27. Assembly and erecting towers

Impact management outcome: No environmental degradation occurs as a result of assembly and erecting of towers.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Prior to erection, assembled towers and tower sections must be stored on elevated surface (suggest wooden blocks) to minimise damage to the underlying vegetation;</li> <li>- In sensitive areas, tower assembly must take place off-site or away from sensitive positions;</li> <li>- The crane used for tower assembly must be operated in a manner which minimises impact to the environment;</li> <li>- The number of crane trips to each site must be minimised;</li> <li>- Wheeled cranes must be utilised in preference to tracked cranes;</li> <li>- Consideration must be given to erecting towers by helicopter or by hand where it is warranted to limit the extent of environmental impact;</li> <li>- Access to tower positions to be undertaken in accordance with access requirements in specified in <i>Section 8.4: Access Roads</i>;</li> <li>- Vegetation clearance to be undertaken in accordance with <i>general vegetation</i></li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact management outcome: No environmental degradation occurs as a result of assembly and erecting of towers.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
clearance requirements specified in Section 8.10: Vegetation clearing; <ul style="list-style-type: none"> <li>- No levelling at tower sites must be permitted unless approved by the Development Project Manager or Developer Site Supervisor;</li> <li>- Topsoil must be removed separately from subsoil material and stored for later use during rehabilitation of such tower sites;</li> <li>- Topsoil must be stored in heaps not higher than 1m to prevent destruction of the seed bank within the topsoil;</li> <li>- Excavated slopes must be no greater than 1:3, but where this is unavoidable, appropriate measures must be undertaken to stabilise the slopes;</li> <li>- Fly rock from blasting activity must be minimised and any pieces greater than 150 mm falling beyond the Working Area, must be collected and removed;</li> <li>- Only existing disturbed areas are utilised as spoil areas;</li> <li>- Drainage is provided to control groundwater exit gradient with the spill areas such that migration of fines is kept to a minimum;</li> <li>- Surface water runoff is appropriately channeled through or around spoil areas;</li> <li>- During backfilling operations, care must be taken not to dump the topsoil at the bottom of the foundation and then put spoil on top of that;</li> <li>- The surface of the spoil is appropriately rehabilitated in accordance with the requirements specified in Section 5.29: Landscaping and rehabilitation;</li> <li>- The retained topsoil must be spread evenly over areas to be rehabilitated and suitably compacted to effect re-vegetation of such areas to prevent erosion as soon as construction activities on the site is complete. Spreading of topsoil must not be undertaken at the beginning of the dry season.</li> </ul>						

### 5.28. Stringing

Impact management outcome: No environmental degradation occurs as a result of stringing.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Where possible, previously disturbed areas must be used for the siting of winch and tensioner stations. In all other instances, the siting of the winch and tensioner must avoid Access restricted areas and other sensitive areas;</li> <li>- The winch and tensioner station must be equipped with drip trays in order to contain any fuel, hydraulic fuel or oil spills and leaks;</li> <li>- Refueling of the winch and tensioner stations must be undertaken in accordance with Section 5.17: Hazardous substances;</li> <li>- In the case of the development of overhead transmission and distribution infrastructure, a one metre "trace-line" may be cut through the vegetation for</li> </ul>						



## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact management outcome: No environmental degradation occurs as a result of stringing.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<p>stringing purposes only and no vehicle access must be cleared along "trace-lines". Vegetation clearing must be undertaken by hand, using chainsaws and hand held implements, with vegetation being cut off at ground level. No tracked or wheeled mechanised equipment must be used;</p> <ul style="list-style-type: none"> <li>- Alternative methods of stringing which limit impact to the environment must always be considered e.g. by hand or by using a helicopter;</li> <li>- Where the stringing operation crosses a public or private road or railway line, the necessary scaffolding/ protection measures must be installed to facilitate access. If, for any reason, such access has to be closed for any period(s) during development, the persons affected must be given reasonable notice, in writing;</li> <li>- No services (electrical distribution lines, telephone lines, roads, railways lines, pipelines fences etc.) must be damaged because of stringing operations. Where disruption to services is unavoidable, persons affected must be given reasonable notice, in writing;</li> <li>- Where stringing operations cross cultivated land, damage to crops is restricted to the minimum required to conduct stringing operations, and reasonable notice (10 work days minimum), in writing, must be provided to the landowner;</li> <li>- Necessary scaffolding protection measures must be installed to prevent damage to the structures supporting certain high value agricultural areas such as vineyards, orchards, nurseries.</li> </ul>						

### 5.29. Socio-economic

Impact management outcome: Socio-economic development is enhanced.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Develop and implement communication strategies to facilitate public participation;</li> <li>- Develop and implement a collaborative and constructive approach to conflict resolution as part of the external stakeholder engagement process;</li> <li>- Sustain continuous communication and liaison with neighboring owners and residents</li> <li>- Create work and training opportunities for local stakeholders; and</li> <li>- Where feasible, no workers, with the exception of security personnel, must be permitted to stay over-night on the site. This would reduce the risk to local farmers.</li> </ul>						

### 5.30. Temporary closure of site

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact management outcome: Minimise the risk of environmental impact during periods of site closure greater than five days.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Bunds must be emptied (where applicable) and need to be undertaken in accordance with the impact management actions included in <i>sections 5.17: management of hazardous substances</i> and <i>5.18 workshop, equipment maintenance and storage</i>;</li> <li>- Hazardous storage areas must be well ventilated;</li> <li>- Fire extinguishers must be serviced and accessible. Service records to be filed and audited at last service;</li> <li>- Emergency and contact details displayed must be displayed;</li> <li>- Security personnel must be briefed and have the facilities to contact or be contacted by relevant management and emergency personnel;</li> <li>- Night hazards such as reflectors, lighting, traffic signage etc. must have been checked;</li> <li>- Fire hazards identified and the local authority must have been notified of any potential threats e.g. large brush stockpiles, fuels etc.;</li> <li>- Structures vulnerable to high winds must be secured;</li> <li>- Wind and dust mitigation must be implemented;</li> <li>- Cement and materials stores must have been secured;</li> <li>- Toilets must have been emptied and secured;</li> <li>- Refuse bins must have been emptied and secured;</li> <li>- Drip trays must have been emptied and secured.</li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

### 5.31. Landscaping and rehabilitation

Impact management outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All areas disturbed by construction activities must be subject to landscaping and rehabilitation; All spoil and waste must be disposed to a registered waste site and certificates of disposal provided;</li> <li>- All slopes must be assessed for contouring, and to contour only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983</li> <li>- All slopes must be assessed for terracing, and to terrace only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983;</li> <li>- Berms that have been created must have a slope of 1:4 and be replanted with indigenous species and grasses that approximates the original condition;</li> <li>- Where new access roads have crossed cultivated farmlands, that lands must be rehabilitated by ripping which must be agreed to by the holder of the EA and the landowners;</li> <li>- Rehabilitation of tower sites and access roads outside of farmland;</li> <li>- Indigenous species must be used for with species and/grasses to where it compliments or approximates the original condition;</li> <li>- Stockpiled topsoil must be used for rehabilitation (refer to Section 5.24: <i>Stockpiling and stockpiled areas</i>);</li> <li>- Stockpiled topsoil must be evenly spread so as to facilitate seeding and minimise loss of soil due to erosion;</li> <li>- Before placing topsoil, all visible weeds from the placement area and from the topsoil must be removed;</li> <li>- Subsoil must be ripped before topsoil is placed;</li> <li>- The rehabilitation must be timed so that rehabilitation can take place at the optimal time for vegetation establishment;</li> <li>- Where impacted through construction related activity, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled ;</li> <li>- Sloped areas stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly;</li> <li>- Spoil can be used for backfilling or landscaping as long as it is covered by a minimum of 150 mm of topsoil.</li> <li>- Where required, re-vegetation including hydro-seeding can be enhanced using a vegetation seed mixture as described below. A mixture of seed can be used provided the mixture is carefully selected to ensure the following:               <ul style="list-style-type: none"> <li>a) Annual and perennial plants are chosen;</li> <li>b) Pioneer species are included;</li> <li>c) Species chosen must be indigenous to the area with the seeds used coming from the area;</li> <li>d) Root systems must have a binding effect on the soil;</li> </ul> </li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact management outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
e) The final product must not cause an ecological imbalance in the area						

### 6. ACCESS TO THE GENERIC EMPr

Once completed and signed, to allow the public access to the generic EMPr, the holder of the EA must make the EMPr available to the public in accordance with the requirements of regulation 26(h) of the EIA Regulations.

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

### PRE-APPROVED GENERIC EMPR TEMPLATE FOR SUBSTATION INFRASTRUCTURE FOR THE TRANSMISSION AND DISTRIBUTION OF ELECTRICITY GOVERNMENT GAZETTE 42323, GOVERNMENT NOTICE 435

#### SECTION 5: IMPACT MANAGEMENT OUTCOMES AND IMPACT MANAGEMENT ACTIONS

This section provides a pre-approved generic EMPr template with aspects that are common to the development of substation infrastructure for the transmission and distribution of electricity. There is a list of aspects identified for the development or expansion of substation infrastructure for the transmission and distribution of electricity, and for each aspect a set of prescribed impact management outcomes and associated impact management actions have been identified. Holders of EAs are responsible to ensure the implementation of these outcomes and actions for all projects as a minimum requirement, in order to mitigate the impact of such aspects identified for the development or expansion of substation infrastructure for the transmission and distribution of electricity.

The template provided below is to be completed by providing the information under each heading for each environmental impact management action.

The completed template must be signed and dated on each page by both the contractor and the holder of the EA prior to commencement of the activity. The method statements prepared and agreed to by the holder of the EA must be appended to the template as Appendix 1. Each method statement must also be duly signed and dated on each page by the contractor and the holder of the EA. This template, once signed and dated, is legally binding. The holder of the EA will remain responsible for its implementation.

##### 5.1. Environmental awareness training

Impact management outcome: All onsite staff are aware and understands the individual responsibilities in terms of this EMPr.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All staff must receive environmental awareness training prior to commencement of the activities;</li> <li>- The Contractor must allow for sufficient sessions to train all personnel with no more than 20 personnel attending each course;</li> <li>- Refresher environmental awareness training is available as and when required;</li> <li>- All staff are aware of the conditions and controls linked to the EA and within the EMPr and made aware of their individual roles and responsibilities in achieving compliance with the EA and EMPr;</li> <li>- The Contractor must erect and maintain information posters at key locations on site, and the posters must include the following information as a minimum:               <ul style="list-style-type: none"> <li>a) Safety notifications; and</li> <li>b) No littering.</li> </ul> </li> <li>- Environmental awareness training must include as a minimum the following:               <ul style="list-style-type: none"> <li>a) Description of significant environmental impacts, actual or potential, related to their work activities;</li> <li>b) Mitigation measures to be implemented when carrying out specific activities;</li> <li>c) Emergency preparedness and response procedures;</li> <li>d) Emergency procedures;</li> <li>e) Procedures to be followed when working near or within sensitive areas;</li> <li>f) Wastewater management procedures;</li> <li>g) Water usage and conservation;</li> <li>h) Solid waste management procedures;</li> </ul> </li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

<b>Impact management outcome:</b> All onsite staff are aware and understands the individual responsibilities in terms of this EMPr.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>i) Sanitation procedures;</li> <li>j) Fire prevention; and</li> <li>k) Disease prevention.</li> </ul> <ul style="list-style-type: none"> <li>– A record of all environmental awareness training courses undertaken as part of the EMPr must be available;</li> <li>– Educate workers on the dangers of open and/or unattended fires;</li> <li>– A staff attendance register of all staff to have received environmental awareness training must be available.</li> <li>– Course material must be available and presented in appropriate languages that all staff can understand.</li> </ul>						

### 5.2. Site Establishment development

<b>Impact management outcome:</b> Impacts on the environment are minimised during site establishment and the development footprint are kept to demarcated development area.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– A method statement must be provided by the contractor prior to any onsite activity that includes the layout of the construction camp in the form of a plan showing the location of key infrastructure and services (where applicable), including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous materials storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management;</li> <li>– Location of camps must be within approved area to ensure that the site does not impact on sensitive areas identified in the environmental assessment or site walk through;</li> <li>– Sites must be located where possible on previously disturbed areas;</li> <li>– The camp must be fenced in accordance with <b>Section 5.5: Fencing and gate installation</b>; and</li> <li>– The use of existing accommodation for contractor staff, where possible, is encouraged.</li> </ul>						

### 5.3. Access restricted areas

<b>Impact management outcome:</b> Access to restricted areas prevented.
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## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Identification of access restricted areas is to be informed by the environmental assessment, site walk through and any additional areas identified during development;</li> <li>- Erect, demarcate and maintain a temporary barrier with clear signage around the perimeter of any access restricted area, colour coding could be used if appropriate; and</li> <li>- Unauthorised access and development related activity inside access restricted areas is prohibited.</li> </ul>						

### 5.4. Access roads

Impact management outcome: Minimise impact to the environment through the planned and restricted movement of vehicles on site.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- An access agreement must be formalised and signed by the DPM, Contractor and landowner before commencing with the activities;</li> <li>- All private roads used for access to the servitude must be maintained and upon completion of the works, be left in at least the original condition</li> <li>- All contractors must be made aware of all these access routes.</li> <li>- Any access route deviation from that in the written agreement must be closed and re-vegetated immediately, at the contractor's expense;</li> <li>- Maximum use of both existing servitudes and existing roads must be made to minimize further disturbance through the development of new roads;</li> <li>- In circumstances where private roads must be used, the condition of the said roads must be recorded in accordance with <b>section 4.9: photographic record</b>; prior to use and the condition thereof agreed by the landowner, the DPM, and the contractor;</li> <li>- Access roads in flattish areas must follow fence lines and tree belts to avoid fragmentation of vegetated areas or croplands</li> <li>- Access roads must only be developed on a pre-planned and approved roads.</li> </ul>						

### 5.5. Fencing and Gate installation

Impact management outcome: Minimise impact to the environment and ensure safe and controlled access to the site through the erection of fencing and gates where required.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Use existing gates provided to gain access to all parts of the area authorised for development, where possible;</li> <li>- Existing and new gates to be recorded and documented in accordance with <b>section</b></li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact management outcome: Minimise impact to the environment and ensure safe and controlled access to the site through the erection of fencing and gates where required.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<p><b>4.9: photographic record;</b></p> <ul style="list-style-type: none"> <li>- All gates must be fitted with locks and be kept locked at all times during the development phase, unless otherwise agreed with the landowner;</li> <li>- At points where the line crosses a fence in which there is no suitable gate within the extent of the line servitude, on the instruction of the DPM, a gate must be installed at the approval of the landowner;</li> <li>- Care must be taken that the gates must be so erected that there is a gap of no more than 100 mm between the bottom of the gate and the ground;</li> <li>- Where gates are installed in jackal proof fencing, a suitable reinforced concrete sill must be provided beneath the gate;</li> <li>- Original tension must be maintained in the fence wires;</li> <li>- All gates installed in electrified fencing must be re-electrified;</li> <li>- All demarcation fencing and barriers must be maintained in good working order for the duration of the development activities;</li> <li>- Fencing must be erected around the camp, batching plants, hazardous storage areas, and all designated access restricted areas, where applicable;</li> <li>- Any temporary fencing to restrict the movement of life-stock must only be erected with the permission of the land owner.</li> <li>- All fencing must be developed of high quality material bearing the SABS mark;</li> <li>- The use of razor wire as fencing must be avoided;</li> <li>- Fenced areas with gate access must remain locked after hours, during weekends and on holidays if staff is away from site. Site security will be required at all times;</li> <li>- On completion of the development phase all temporary fences are to be removed;</li> <li>- The contractor must ensure that all fence uprights are appropriately removed, ensuring that no uprights are cut at ground level but rather removed completely.</li> </ul>						

### 5.6. Water Supply Management

Impact management outcome: Undertake responsible water usage.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All abstraction points or bore holes must be registered with the DWS and suitable water meters installed to ensure that the abstracted volumes are measured on a daily basis;</li> <li>- The Contractor must ensure the following:               <ul style="list-style-type: none"> <li>a. The vehicle abstracting water from a river does not enter or cross it and does not operate from within the river;</li> <li>b. No damage occurs to the river bed or banks and that the abstraction of</li> </ul> </li> </ul>						



## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

<p>water does not entail stream diversion activities; and</p> <p>c. All reasonable measures to limit pollution or sedimentation of the downstream watercourse are implemented.</p> <p>– Ensure water conservation is being practiced by:</p> <p>a. Minimising water use during cleaning of equipment;</p> <p>b. Undertaking regular audits of water systems; and</p> <p>c. Including a discussion on water usage and conservation during environmental awareness training.</p> <p>d. The use of grey water is encouraged.</p>						
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### 5.7. Storm and waste water management

<b>Impact management outcome:</b> Impacts to the environment caused by storm water and wastewater discharges during construction are avoided.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Runoff from the cement/ concrete batching areas must be strictly controlled, and contaminated water must be collected, stored and either treated or disposed of off-site, at a location approved by the project manager;</li> <li>– All spillage of oil onto concrete surfaces must be controlled by the use of an approved absorbent material and the used absorbent material disposed of at an appropriate waste disposal facility;</li> <li>– Natural storm water runoff not contaminated during the development and clean water can be discharged directly to watercourses and water bodies, subject to the Project Manager’s approval and support by the ECO;</li> <li>– Water that has been contaminated with suspended solids, such as soils and silt, may be released into watercourses or water bodies only once all suspended solids have been removed from the water by settling out these solids in settlement ponds. The release of settled water back into the environment must be subject to the Project Manager’s approval and support by the ECO.</li> </ul>						

### 5.8. Solid and hazardous waste management

<b>Impact management outcome:</b> Wastes are appropriately stored, handled and safely disposed of at a recognised waste facility.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– All measures regarding waste management must be undertaken using an integrated waste management approach;</li> <li>– Sufficient, covered waste collection bins (scavenger and weatherproof) must be provided;</li> <li>– A suitably positioned and clearly demarcated waste collection site must be identified and provided;</li> <li>– The waste collection site must be maintained in a clean and orderly manner;</li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact management outcome: Wastes are appropriately stored, handled and safely disposed of at a recognised waste facility.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Waste must be segregated into separate bins and clearly marked for each waste type for recycling and safe disposal;</li> <li>- Staff must be trained in waste segregation;</li> <li>- Bins must be emptied regularly;</li> <li>- General waste produced onsite must be disposed of at registered waste disposal sites/ recycling company;</li> <li>- Hazardous waste must be disposed of at a registered waste disposal site;</li> <li>- Certificates of safe disposal for general, hazardous and recycled waste must be maintained.</li> </ul>						

### 5.9. Protection of watercourses and estuaries

Impact management outcome: Pollution and contamination of the watercourse environment and or estuary erosion are prevented.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All watercourses must be protected from direct or indirect spills of pollutants such as solid waste, sewage, cement, oils, fuels, chemicals, aggregate tailings, wash and contaminated water or organic material resulting from the Contractor's activities;</li> <li>- In the event of a spill, prompt action must be taken to clear the polluted or affected areas;</li> <li>- Where possible, no development equipment must traverse any seasonal or permanent wetland</li> <li>- No return flow into the estuaries must be allowed and no disturbance of the Estuarine functional Zone should occur;</li> <li>- Development of permanent watercourse or estuary crossing must only be undertaken where no alternative access to tower position is available;</li> <li>- There must not be any impact on the long term morphological dynamics of watercourses or estuaries;</li> <li>- Existing crossing points must be favored over the creation of new crossings (including temporary access)</li> <li>- When working in or near any watercourse or estuary, the following environmental controls and consideration must be taken:               <ul style="list-style-type: none"> <li>a) Water levels during the period of construction;</li> <li>b) No altering of the bed, banks, course or characteristics of a watercourse</li> <li>c) During the execution of the works, appropriate measures to prevent pollution and contamination of the riparian environment must be implemented e.g. including ensuring that construction equipment is well</li> </ul> </li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact management outcome: Pollution and contamination of the watercourse environment and or estuary erosion are prevented.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
maintained; d) Where earthwork is being undertaken in close proximity to any watercourse, slopes must be stabilised using suitable materials, i.e. sandbags or geotextile fabric, to prevent sand and rock from entering the channel; and e) Appropriate rehabilitation and re-vegetation measures for the watercourse banks must be implemented timeously. In this regard, the banks should be appropriately and incrementally stabilised as soon as development allows.						

### 5.10. Vegetation clearing

Impact management outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<b>General:</b> <ul style="list-style-type: none"> <li>- Indigenous vegetation which does not interfere with the development must be left undisturbed;</li> <li>- Protected or endangered species may occur on or near the development site. Special care should be taken not to damage such species;</li> <li>- Search, rescue and replanting of all protected and endangered species likely to be damaged during project development must be identified by the relevant specialist and completed prior to any development or clearing;</li> <li>- Permits for removal must be obtained from the relevant CA prior to the cutting or clearing of the affected species, and they must be filed;</li> <li>- The Environmental Audit Report must confirm that all identified species have been rescued and replanted and that the location of replanting is compliant with conditions of approvals;</li> <li>- Trees felled due to construction must be documented and form part of the Environmental Audit Report;</li> <li>- Rivers and watercourses must be kept clear of felled trees, vegetation cuttings and debris;</li> <li>- Only a registered pest control operator may apply herbicides on a commercial basis and commercial application must be carried out under the supervision of a registered pest control operator, supervision of a registered pest control operator or is appropriately trained;</li> <li>- A daily register must be kept of all relevant details of herbicide usage;</li> <li>- No herbicides must be used in estuaries;</li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

<b>Impact management outcome:</b> Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All protected species and sensitive vegetation not removed must be clearly marked and such areas fenced off in accordance to <b>Section 5.3: Access restricted areas</b>.</li> <li>Alien invasive vegetation must be removed and disposed of at a licensed waste management facility.</li> </ul>						

### 5.11. Protection of fauna

<b>Impact management outcome:</b> Disturbance to fauna is minimised.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- No interference with livestock must occur without the landowner's written consent and with the landowner or a person representing the landowner being present;</li> <li>- The breeding sites of raptors and other wild birds species must be taken into consideration during the planning of the development programme;</li> <li>- Breeding sites must be kept intact and disturbance to breeding birds must be avoided. Special care must be taken where nestlings or fledglings are present;</li> <li>- Special recommendations of the avian specialist must be adhered to at all times to prevent unnecessary disturbance of birds;</li> <li>- No poaching must be tolerated under any circumstances. All animal dens in close proximity to the works areas must be marked as Access restricted areas;</li> <li>- No deliberate or intentional killing of fauna is allowed;</li> <li>- In areas where snakes are abundant, snake deterrents to be deployed on the pylons to prevent snakes climbing up, being electrocuted and causing power outages; and</li> <li>- No Threatened or Protected species (ToPs) and/or protected fauna as listed according NEMBA (Act No. 10 of 2004) and relevant provincial ordinances may be removed and/or relocated without appropriate authorisations/permits.</li> </ul>						

### 5.12. Protection of heritage resources

<b>Impact management outcome:</b> Impact to heritage resources is minimised.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Identify, demarcate and prevent impact to all known sensitive heritage features on</li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

<p>site in accordance with the No-Go procedure in <i>Section 5.3: Access restricted areas</i>;</p> <ul style="list-style-type: none"> <li>- Carry out general monitoring of excavations for potential fossils, artefacts and material of heritage importance;</li> <li>- All work must cease immediately, if any human remains and/or other archaeological, palaeontological and historical material are uncovered. Such material, if exposed, must be reported to the nearest museum, archaeologist/palaeontologist (or the South African Police Services), so that a systematic and professional investigation can be undertaken. Sufficient time must be allowed to remove/collect such material before development recommences.</li> </ul>						
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### 5.13. Safety of the public

<p><b>Impact management outcome:</b> All precautions are taken to minimise the risk of injury, harm or complaints.</p>						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Identify fire hazards, demarcate and restrict public access to these areas as well as notify the local authority of any potential threats e.g. large brush stockpiles, fuels etc.;</li> <li>- All unattended open excavations must be adequately fenced or demarcated;</li> <li>- Adequate protective measures must be implemented to prevent unauthorised access to and climbing of partly constructed towers and protective scaffolding;</li> <li>- Ensure structures vulnerable to high winds are secured;</li> <li>- Maintain an incidents and complaints register in which all incidents or complaints involving the public are logged.</li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

### 5.14. Sanitation

Impact management outcome: Clean and well maintained toilet facilities are available to all staff in an effort to minimise the risk of disease and impact to the environment.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Mobile chemical toilets are installed onsite if no other ablution facilities are available;</li> <li>- The use of ablution facilities and or mobile toilets must be used at all times and no indiscriminate use of the veld for the purposes of ablutions must be permitted under any circumstances;</li> <li>- Where mobile chemical toilets are required, the following must be ensured:               <ul style="list-style-type: none"> <li>a) Toilets are located no closer than 100 m to any watercourse or water body;</li> <li>b) Toilets are secured to the ground to prevent them from toppling due to wind or any other cause;</li> <li>c) No spillage occurs when the toilets are cleaned or emptied and the contents are managed in accordance with the EMPr;</li> <li>d) Toilets have an external closing mechanism and are closed and secured from the outside when not in use to prevent toilet paper from being blown out;</li> <li>e) Toilets are emptied before long weekends and workers holidays, and must be locked after working hours;</li> <li>f) Toilets are serviced regularly and the ECO must inspect toilets to ensure compliance to health standards;</li> </ul> </li> <li>- A copy of the waste disposal certificates must be maintained.</li> </ul>						

### 5.15. Prevention of disease

Impact Management outcome: All necessary precautions linked to the spread of disease are taken.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Undertake environmentally-friendly pest control in the camp area;</li> <li>- Ensure that the workforce is sensitised to the effects of sexually transmitted diseases, especially HIV AIDS;</li> <li>- The Contractor must ensure that information posters on AIDS are displayed in the Contractor Camp area;</li> <li>- Information and education relating to sexually transmitted diseases to be made available to both construction workers and local community, where applicable;</li> <li>- Free condoms must be made available to all staff on site at central points;</li> <li>- Medical support must be made available;</li> <li>- Provide access to Voluntary HIV Testing and Counselling Services.</li> </ul>						

### 5.16. Emergency procedures

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact management outcome: Emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Compile an Emergency Response Action Plan (ERAP) prior to the commencement of the proposed project;</li> <li>- The Emergency Plan must deal with accidents, potential spillages and fires in line with relevant legislation;</li> <li>- All staff must be made aware of emergency procedures as part of environmental awareness training;</li> <li>- The relevant local authority must be made aware of a fire as soon as it starts;</li> <li>- In the event of emergency necessary mitigation measures to contain the spill or leak must be implemented (see <i>Hazardous Substances section 5.17</i>).</li> </ul>						

### 5.17. Hazardous substances

Impact management outcome: Safe storage, handling, use and disposal of hazardous substances.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- The use and storage of hazardous substances to be minimised and non-hazardous and non-toxic alternatives substituted where possible;</li> <li>- All hazardous substances must be stored in suitable containers as defined in the Method Statement;</li> <li>- Containers must be clearly marked to indicate contents, quantities and safety requirements;</li> <li>- All storage areas must be bunded. The bunded area must be of sufficient capacity to contain a spill / leak from the stored containers;</li> <li>- Bunded areas to be suitably lined with a SABS approved liner;</li> <li>- An Alphabetical Hazardous Chemical Substance (HCS) control sheet must be drawn up and kept up to date on a continuous basis;</li> <li>- All hazardous chemicals that will be used on site must have Material Safety Data Sheets (MSDS);</li> <li>- All employees working with HCS must be trained in the safe use of the substance and according to the safety data sheet;</li> <li>- Employees handling hazardous substances / materials must be aware of the potential impacts and follow appropriate safety measures. Appropriate personal protective equipment must be made available;</li> <li>- The Contractor must ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks or in bowzers;</li> <li>- The tanks/ bowzers must be situated on a smooth impermeable surface (concrete) with a permanent bund. The impermeable lining must extend to the crest of the bund and the volume inside the bund must be 130% of the total capacity of all the</li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact management outcome: Safe storage, handling, use and disposal of hazardous substances.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<p>storage tanks/ bowlers (110% statutory requirement plus an allowance for rainfall);</p> <ul style="list-style-type: none"> <li>– The floor of the bund must be sloped, draining to an oil separator;</li> <li>– Provision must be made for refueling at the storage area by protecting the soil with an impermeable groundcover. Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained;</li> <li>– All empty externally dirty drums must be stored on a drip tray or within a bunded area;</li> <li>– No unauthorised access into the hazardous substances storage areas must be permitted;</li> <li>– No smoking must be allowed within the vicinity of the hazardous storage areas;</li> <li>– Adequate fire-fighting equipment must be made available at all hazardous storage areas;</li> <li>– Where refueling away from the dedicated refueling station is required, a mobile refueling unit must be used. Appropriate ground protection such as drip trays must be used;</li> <li>– An appropriately sized spill kit kept onsite relevant to the scale of the activity/s involving the use of hazardous substance must be available at all times;</li> <li>– The responsible operator must have the required training to make use of the spill kit in emergency situations;</li> <li>– An appropriate number of spill kits must be available and must be located in all areas where activities are being undertaken;</li> <li>– In the event of a spill, contaminated soil must be collected in containers and stored in a central location and disposed of according to the National Environmental Management: Waste Act 59 of 2008. Refer to <i>Section 5.7</i> for procedures concerning <i>storm and waste water management</i> and <i>5.8</i> for <i>solid and hazardous waste management</i>.</li> </ul>						

### 5.18. Workshop, equipment maintenance and storage

Impact management outcome: Soil, surface water and groundwater contamination is minimised.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Where possible and practical all maintenance of vehicles and equipment must take place in the workshop area;</li> <li>– During servicing of vehicles or equipment, especially where emergency repairs are effected outside the workshop area, a suitable drip tray must be used to prevent spills onto the soil. The relevant local authority must be made aware of a fire as soon as it starts;</li> </ul>						



## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

<ul style="list-style-type: none"> <li>- Leaking equipment must be repaired immediately or be removed from site to facilitate repair;</li> <li>- Workshop areas must be monitored for oil and fuel spills;</li> <li>- Appropriately sized spill kit kept onsite relevant to the scale of the activity taking place must be available;</li> <li>- The workshop area must have a bunded concrete slab that is sloped to facilitate runoff into a collection sump or suitable oil / water separator where maintenance work on vehicles and equipment can be performed;</li> <li>- Water drainage from the workshop must be contained and managed in accordance Section 5.7: <i>Storm and waste water management</i>.</li> </ul>					
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### 5.19. Batching plants

Impact management outcome: Minimise spillages and contamination of soil, surface water and groundwater.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Concrete mixing must be carried out on an impermeable surface;</li> <li>- Batching plants areas must be fitted with a containment facility for the collection of cement laden water.</li> <li>- Dirty water from the batching plant must be contained to prevent soil and groundwater contamination</li> <li>- Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains;</li> <li>- A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted;</li> <li>- Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licenced disposal facility;</li> <li>- Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site;</li> <li>- Sand and aggregates containing cement must be kept damp to prevent the generation of dust (Refer to <i>Section 5.20: Dust emissions</i>)</li> <li>- Any excess sand, stone and cement must be removed or reused from site on completion of construction period and disposed at a registered disposal facility;</li> <li>- Temporary fencing must be erected around batching plants in accordance with Section 5.5: <i>Fencing and gate installation</i>.</li> </ul>						

### 5.20. Dust emissions

Impact management outcome: Dust prevention measures are applied to minimise the generation of dust.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Take all reasonable measures to minimise the generation of dust as a result of project development activities to the satisfaction of the ECO;</li> <li>- Removal of vegetation must be avoided until such time as soil stripping is required and similarly exposed surfaces must be re- vegetated or stabilised as soon as is</li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact management outcome: Dust prevention measures are applied to minimise the generation of dust.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
practically possible; – Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present; – During high wind conditions, the ECO must evaluate the situation and make recommendations as to whether dust-damping measures are adequate, or whether working will cease altogether until the wind speed drops to an acceptable level; – Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind; – Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of the ECO; – Vehicle speeds must not exceed 40 km/h along dust roads or 20 km/h when traversing unconsolidated and non-vegetated areas; – Straw stabilisation must be applied at a rate of one bale/10 m <sup>2</sup> and harrowed into the top 100 mm of top material, for all completed earthworks; – For significant areas of excavation or exposed ground, dust suppression measures must be used to minimise the spread of dust.						

### 5.21. Blasting

Impact management outcome: Impact to the environment is minimised through a safe blasting practice.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Any blasting activity must be conducted by a suitably licensed blasting contractor; and – Notification of surrounding landowners, emergency services site personnel of blasting activity 24 hours prior to such activity taking place on Site.						

### 5.22. Noise

Impact Management outcome: Prevent unnecessary noise to the environment by ensuring that noise from development activity is mitigated.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– The Contractor must keep noise level within acceptable limits, Restrict the use of sound amplification equipment for communication and emergency only; – All vehicles and machinery must be fitted with appropriate silencing technology and must be properly maintained;						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact Management outcome: Prevent unnecessary noise to the environment by ensuring that noise from development activity is mitigated.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Any complaints received by the Contractor regarding noise must be recorded and communicated. Where possible or applicable, provide transport to and from the site on a daily basis for construction workers;</li> <li>- Develop a Code of Conduct for the construction phase in terms of behaviour of construction staff. Operating hours as determined by the environmental authorisation are adhered to during the development phase. Where not defined, it must be ensured that development activities must still meet the impact management outcome related to noise management.</li> </ul>						

### 5.23. Fire prevention

Impact management outcome: Prevention of uncontrollable fires.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Designate smoking areas where the fire hazard could be regarded as insignificant;</li> <li>- Firefighting equipment must be available on all vehicles located on site;</li> <li>- The local Fire Protection Agency (FPA) must be informed of construction activities;</li> <li>- Contact numbers for the FPA and emergency services must be communicated in environmental awareness training and displayed at a central location on site;</li> <li>- Two way swop of contact details between ECO and FPA.</li> </ul>						

### 5.24. Stockpiling and stockpile areas

Impact management outcome: Reduce erosion and sedimentation as a result of stockpiling.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All material that is excavated during the project development phase (either during piling (if required) or earthworks) must be stored appropriately on site in order to minimise impacts to watercourses, watercourses and water bodies;</li> <li>- All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods;</li> <li>- Topsoil stockpiles must not exceed 2 m in height;</li> <li>- During periods of strong winds and heavy rain, the stockpiles must be covered with appropriate material (e.g. cloth, tarpaulin etc.);</li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact management outcome: Reduce erosion and sedimentation as a result of stockpiling.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Where possible, sandbags (or similar) must be placed at the bases of the stockpiled material in order to prevent erosion of the material.						

### 5.25. Civil works

Impact management outcome: Impact to the environment minimised during civil works to create the substation terrace.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Where terracing is required, topsoil must be collected and retained for the purpose of re-use later to rehabilitate disturbed areas not covered by yard stone;</li> <li>– Areas to be rehabilitated include terrace embankments and areas outside the high voltage yards;</li> <li>– Where required, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled;</li> <li>– These areas can be stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly;</li> <li>– Rehabilitation of the disturbed areas must be managed in accordance with <b>Section 5.35: Landscaping and rehabilitation</b>;</li> <li>– All excess spoil generated during terracing activities must be disposed of in an appropriate manner and at a recognised landfill site; and</li> <li>– Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes.</li> </ul>						

### 5.26. Excavation of foundation, cable trenching and drainage systems

Impact management outcome: No environmental degradation occurs as a result of excavation of foundation, cable trenching and drainage systems.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– All excess spoil generated during foundation excavation must be disposed of in an appropriate manner and at a licensed landfill site, if not used for backfilling purposes;</li> <li>– Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes;</li> <li>– Management of equipment for excavation purposes must be undertaken in</li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

accordance with <b>Section 5.18: Workshop, equipment maintenance and storage;</b> and – Hazardous substances spills from equipment must be managed in accordance with <b>Section 5.17: Hazardous substances.</b>						
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### 5.27. Installation of foundations, cable trenching and drainage systems

<b>Impact management outcome:</b> No environmental degradation occurs during the installation of foundation, cable trenching and drainage system.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Batching of cement to be undertaken in accordance with <b>Section 5.19: Batching plants;</b> and – Residual solid waste must be disposed of in accordance with <b>Section 5.8: Solid waste and hazardous management.</b>						

### 5.28. Installation of equipment (circuit breakers, current Transformers, Isolators, Insulators, surge arresters, voltage transformers, earth switches)

<b>Impact management outcome:</b> No environmental degradation occurs as a result of installation of equipment.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Management of dust must be conducted in accordance with <b>Section 5. 20: Dust emissions;</b> – Management of equipment used for installation must be conducted in accordance with <b>Section 5.18: Workshop, equipment maintenance and storage;</b> – Management hazardous substances and any associated spills must be conducted in accordance with <b>Section 5.17: Hazardous substances;</b> and – Residual solid waste must be recycled or disposed of in accordance with <b>Section 5.8: Solid waste and hazardous management.</b>						

### 5.29. Steelwork Assembly and Erection

<b>Impact management outcome:</b> No environmental degradation occurs as a result of steelwork assembly and erection.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– During assembly, care must be taken to ensure that no wasted/unused materials are left on site e.g. bolts and nuts – Emergency repairs due to breakages of equipment must be managed in accordance with <b>Section 5. 18: Workshop, equipment maintenance and</b>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

<i>storage and Section 5.16: Emergency procedures.</i>						
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### 5.30. Cabling and Stringing

<b>Impact management outcome:</b> No environmental degradation occurs as a result of stringing.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Residual solid waste (off cuts etc.) shall be recycled or disposed of in accordance with <b>Section 6.8: Solid waste and hazardous Management;</b></li> <li>- Management of equipment used for installation shall be conducted in accordance with <b>Section 5.18: Workshop, equipment maintenance and storage;</b></li> <li>- Management hazardous substances and any associated spills shall be conducted in accordance with <b>Section 5.17: Hazardous substances.</b></li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

### 5.31. Testing and Commissioning (all equipment testing, earthing system, system integration)

<b>Impact management outcome:</b> No environmental degradation occurs as a result of Testing and Commissioning.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Residual solid waste must be recycled or disposed of in accordance with <b>Section 5.8: Solid waste and hazardous management.</b></li> </ul>						

### 5.32. Socio-economic

<b>Impact management outcome:</b> enhanced socio-economic development.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Develop and implement communication strategies to facilitate public participation;</li> <li>- Develop and implement a collaborative and constructive approach to conflict resolution as part of the external stakeholder engagement process;</li> <li>- Sustain continuous communication and liaison with neighboring owners and residents</li> <li>- Create work and training opportunities for local stakeholders; and</li> <li>- Where feasible, no workers, with the exception of security personnel, must be permitted to stay over-night on the site. This would reduce the risk to local farmers.</li> </ul>						

### 5.33. Temporary closure of site

<b>Impact management outcome:</b> Minimise the risk of environmental impact during periods of site closure greater than five days.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Bunds must be emptied (where applicable) and need to be undertaken in accordance with the impact management actions included in <b>sections 5.17: Hazardous substances and 5.18: Workshop, equipment maintenance and storage;</b></li> <li>- Hazardous storage areas must be well ventilated;</li> <li>- Fire extinguishers must be serviced and accessible. Service records to be filed and audited at last service;</li> <li>- Emergency and contact details displayed must be displayed;</li> <li>- Security personnel must be briefed and have the facilities to contact or be contacted by relevant management and emergency personnel;</li> <li>- Night hazards such as reflectors, lighting, traffic signage etc. must have been</li> </ul>						

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Impact management outcome: Minimise the risk of environmental impact during periods of site closure greater than five days.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
checked; – Fire hazards identified and the local authority must have been notified of any potential threats e.g. large brush stockpiles, fuels etc.; – Structures vulnerable to high winds must be secured; – Wind and dust mitigation must be implemented; – Cement and materials stores must have been secured; – Toilets must have been emptied and secured; – Refuse bins must have been emptied and secured; – Drip trays must have been emptied and secured.						

### 5.34. Dismantling of old equipment

Impact management outcome: Impact to the environment to be minimised during the dismantling, storage and disposal of old equipment commissioning.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All old equipment removed during the project must be stored in such a way as to prevent pollution of the environment; – Oil containing equipment must be stored to prevent leaking or be stored on drip trays; – All scrap steel must be stacked neatly and any disused and broken insulators must be stored in containers; – Once material has been scrapped and the contract has been placed for removal, the disposal Contractor must ensure that any equipment containing pollution causing substances is dismantled and transported in such a way as to prevent spillage and pollution of the environment; – The Contractor must also be equipped to contain and clean up any pollution causing spills; and – Disposal of unusable material must be at a licensed waste disposal site.						



## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

### 5.35. Landscaping and rehabilitation

Impact management outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- All areas disturbed by construction activities must be subject to landscaping and rehabilitation; All spoil and waste must be disposed of to a registered waste site;</li> <li>- All slopes must be assessed for contouring, and to contour only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983</li> <li>- All slopes must be assessed for terracing, and to terrace only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983;</li> <li>- Berms that have been created must have a slope of 1:4 and be replanted with indigenous species and grasses that approximates the original condition;</li> <li>- Where new access roads have crossed cultivated farmlands, that lands must be rehabilitated by ripping which must be agreed to by the holder of the EA and the landowners;</li> <li>- Rehabilitation of access roads outside of farmland;</li> <li>- Indigenous species must be used for with species and/grasses to where it compliments or approximates the original condition;</li> <li>- Stockpiled topsoil must be used for rehabilitation (refer to <b>Section 5.24: Stockpiling and stockpiled areas</b>);</li> <li>- Stockpiled topsoil must be evenly spread so as to facilitate seeding and minimise loss of soil due to erosion;</li> <li>- Before placing topsoil, all visible weeds from the placement area and from the topsoil must be removed;</li> <li>- Subsoil must be ripped before topsoil is placed;</li> <li>- The rehabilitation must be timed so that rehabilitation can take place at the optimal time for vegetation establishment;</li> <li>- Where impacted through construction related activity, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled;</li> <li>- Sloped areas stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly;</li> <li>- Spoil can be used for backfilling or landscaping as long as it is covered by a minimum of 150 mm of topsoil.</li> <li>- Where required, re-vegetation including hydro-seeding can be enhanced using a vegetation seed mixture as described below. A mixture of seed can be used provided the mixture is carefully selected to ensure the following:               <ul style="list-style-type: none"> <li>a) Annual and perennial plants are chosen;</li> <li>b) Pioneer species are included;</li> <li>c) Species chosen must be indigenous to the area with the seeds used coming from the area;</li> <li>d) Root systems must have a binding effect on the soil;</li> <li>e) The final product must not cause an ecological imbalance in the area</li> </ul> </li> </ul>						

## **SECTION F: APPENDICES**

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

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### **6. ACCESS TO THE GENERIC EMPr**

Once completed and signed, to allow the public access to the generic EMPr, the holder of the EA must make the EMPr available to the public in accordance with the requirements of Regulation 26(h) of the EIA Regulations.

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

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### 10. APPENDIX B – CURRICULUM VITAE OF THE EAP

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#### CV of Paul Lochner (EMS Manager and Reviewer)

Name of firm	CSIR
Name of staff	Paul Andrew Lochner
Profession	Environmental Assessment and Management
Position in firm	Project Leader in Environmental Assessment & Management
Date of birth	13 June 1969
Years with firm	20 years
Nationality	South African

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**Biographical sketch** Paul Lochner commenced work at CSIR in 1992, after completing a degree in Civil Engineering and a Masters in Environmental Science, both at the University of Cape Town. His initial work at CSIR focused on sediment dynamics and soft engineering applications in the coastal zone, in particular, beach and dune management. He conducted several shoreline erosion analyses and prepared coastal zone management plans for beaches. He also prepared wetland management plans.

As the market for environmental assessment work grew, he led Environmental Impact Assessments (EIAs), in particular for coastal resort developments and large-scale industrial developments located on the coast; and Environmental Management Plans (EMPs), in particular for wetlands, estuaries and coastal developments. He has also been involved in researching and applying higher-level approaches to environmental assessment and management, such as Strategic Environmental Assessment (SEA). In 1998 and 1999, he coordinated the SEA research programme within the CSIR, and was a lead author of the Guideline Document for SEA in South Africa, published jointly by CSIR and the national Department of Environmental Affairs and Tourism in February 2000.

In 1999 and 2000, he was the project manager for the legal, institutional, policy, financial and socio-economic component of the Cape Action Plan for the Environment ("CAPE"), a large-scale multi-disciplinary study to ensure the sustainable conservation of the Cape Floral Kingdom. This was funded by the Global Environmental Fund (GEF) and prepared for WWF-South Africa. The study required extensive stakeholder interaction, in particular with government institutions, leading to the development of a Strategy and Action Plan for regional conservation.

In July 2003, he was certified as an Environmental Assessment Practitioner by the Interim Certification Board for Environmental Assessment Practitioners of South Africa. In 2004 he was lead author of the *Overview of IEM* document in the updated Integrated Environmental Management (IEM) Information Series published by national Department of Environmental Affairs and Tourism (DEFFT). In 2004-2005 he was project manager for an Environmental and Social Impact Assessment (ESIA) conducted for a bauxite mine and alumina refinery in the Komi Republic (Russia), prepared in accordance with World Bank and EU policies, guidelines and standards.

In 2004-2005, he was part of the CSIR team that coordinated the preparation of the series of *Guidelines for involving specialists in EIA processes* prepared for the Western Cape Department of Environmental Affairs and Development Planning (DEFDPP); and authored the *Guideline for Environmental Management Plans* published by the Western Cape government in 2005.

In 2009, he led the EIA for a desalination plant in Namibia, as well as several EIAs for wind

## SECTION F: APPENDICES

### Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

energy facilities in South Africa.

Over the past 16 years has been closely involved with several environmental studies for industrial and port-related projects in Coega Industrial Development Zone (IDZ), near Port Elizabeth. This included the SEA for the establishment of the Coega IDZ in 1996/7, an EIA and EMP for a proposed aluminium smelter in 2002/3, and assistance with environmental permit applications for air, water and waste. At the Coega IDZ and port, he has also conducted environmental assessments for port development, LNG storage and a combined cycle gas turbine power plant, manganese export, rail development, and wind energy projects.

Education	1990	B.Sc. Civil Engineering (awarded with Honours)	University of Cape Town
	1992	M. Phil. Environmental Science	University of Cape Town

**Employment record**

*January 1992 to June 1992:* Completed Masters thesis, working in conjunction with the Environmental Evaluation Unit at the University of Cape Town. The thesis investigated the potential future ecological and socio-economic impacts resulting from the closure of a large diamond mining operation, and developed actions to mitigate these impacts.

*October 1992 to present:* Employed by the CSIR in Stellenbosch. Involved in coastal engineering studies; and various forms of environmental assessment and management studies. (A track record of experience is listed below).

#### PROFESSIONAL INVOLVEMENT IN COMMITTEES:

<i>1996/97:</i>	Committee Member of the Western Cape Branch of the International Association for Impact Assessment (IAIA)
<i>1997/98:</i>	Chairperson of the Western Cape Branch of IAIA and member of the national IAIA committee
<i>1998/99:</i>	Committee Member of the Western Cape Branch of IAIA
<i>1996 to present:</i>	Chairperson of the Bloulei Environmental Committee at Century City, Cape Town (This committee is tasked with overseeing the restoration and management of a wetland in the midst of a new mixed-use urban development)

**Experience record**

The following table presents an abridged list of projects that Paul Lochner has been involved in, indicating his role in each project:

Completion Date	1. Project description	Role	Client
2011 - 2012	EIA for the <b>100 MW solar photovoltaic</b> project proposed by Mainstream Renewable Power at Blocuso, near Keimoes in the Northern Cape	Project leader	Mainstream Renewable Power

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Completion Date	1. Project description	Role	Client
2011 – 2012	EIA for the <b>100 MW solar photovoltaic</b> project proposed by Mainstream Renewable Power at Roo de Kop Farm, near Douglas, in the Northern Cape	Project leader	Mainstream Renewable Power
2011 – 2012	EIA for the 75 MW <b>solar photovoltaic project</b> proposed by Solaire Direct at <b>GlenThorne</b> , near Bloemfontein in the Free State	Project leader	Solaire Direct
2011 – 2012	EIA for the 75 MW <b>solar photovoltaic project</b> proposed by SolaireDirect at <b>Valleydora</b> , near Springfontein in the Free State	Project leader	Solaire Direct
2012 (in progress)	EIA for the 80 MW <b>solar photovoltaic project</b> by CAMAC on Farm O’Poort near postmasburg.	Project leader	CAMAC International
2010-2011	More than 10 Basic Assessments (BAs) for <b>solar photovoltaic projects</b> in the western cape, Northern Cape, Eastern Cape and Free State	Project leader	Various clients including Dutch, German, French and South African companies
2010/2011 <i>(in progress)</i>	<b>EIA for the Langerfontein</b> wind project near Darling, Western Cape.	Project leader	Mr Herman Oelsner, Khwe Khoa
2010/2011 <i>(final report completed)</i>	<b>EIA for a 100 MW wind project at Zuurbron and a 50 MW wind project Broadlands</b> in the Eastern Cape	Project leader	WindCurrent SA (German-based company)
2010/2011 <i>(final report completed)</i>	<b>EIA for the proposed 143 MW Biotherm wind energy project near Swellendam</b> , Western Cape, South Africa	Project leader	Biotherm South Africa (Pty) Ltd
2010/2011 <i>(final report completed)</i>	<b>EIA for the proposed InnoWind wind energy projects near Swellendam, Heidelberg, Albertinia and Mossel Bay (totalling approx 210 MW)</b> , Western Cape, South Africa	Project leader	InnoWind South Africa (Pty) Ltd
2009/2010 <i>(authorisation granted by DEFF in Aug 2011)</i>	<b>EIA for the proposed Electrawinds wind energy facility</b> of 45-75 MW capacity in the Coega IDZ, Eastern Cape	Project leader	Electrawinds N.V. (Belgium)
2009/2010 <i>(authorisation granted by DEFF in April 2011)</i>	<b>EIA for proposed 180 MW Jeffreys Bay wind energy project</b> , Eastern Cape	Project Leader and co-author	Mainstream Renewable Power South Africa
2009/2010 <i>(authorisation granted by DEFF)</i>	<b>Basic Assessment for the national wind Atlas for South Africa</b>	Project leader	SANERI and SA Wind Energy Programme, Dept of Energy
2009/2010 <i>(on hold)</i>	<b>EIA for the proposed Gecko soda plant</b> , Otjivalunda and Arandis, Namibia	Project leader	Gecko, Namibia
2009	<b>EIA for the proposed desalination plant</b> at Swakopmund, Namibia	Project leader	NamWater, Namibia
2009	<b>EMP for the Operational Phase of the Berg River Dam</b> , Franschoek, South Africa	Project leader and report co-author	TCTA, South Africa
2009/2010 <i>(in progress)</i>	<b>EIA for the proposed crude oil refinery</b> at Coega, South Africa	Project leader and lead author	PetroSA, South Africa
2008	<b>Environmental Risk Review</b> for proposed LNG/CNG import to Mossel Bay, South Africa	Project leader and lead author	PetroSA, South Africa
2008	<b>Review of the Business Plan</b> for catchment management for the Berg Water Dam Project, Franschoek, South Africa	Project reviewer and co-author	TCTA, South Africa
2007 – 2010 <i>(in progress)</i>	<b>EIA for proposed Jacobsbaai Tortoise Reserve eco-development</b> , Saldanha, Western Cape	Project Leader and co-author	Jacobsbaai Tortoise Reserve (Pty) Ltd
2007 – 2010	<b>Independent reviewer</b> for the EIA proposed	Independent reviewer	Public Process Consultants and

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Completion Date	1. Project description	Role	Client
<i>(in progress)</i>	Amanzi lifestyle development, Port Elizabeth	appointed to advise EAP	Pam Golding
2007 – 2008	<b>EIA for proposed 18 MW Kouga wind energy project</b> , Eastern Cape	Project Leader and co-author	Genesis Eco-Energy (Approved by DEDEFF in March 2009)
2007	<b>Review of EIA for the proposed Hanglip Eco-Development</b> , Plettenberg Bay, Western Cape	Co-author of review of EIA, undertaken on behalf of DEFFDP	Dept of Environmental Affairs & Development Planning, Western Cape
2006-2007	<b>Scoping phase for the EIA for the proposed Coega LNG-to-Power Project</b> at the Port of Ngqura, Coega IDZ	Project Leader and co-author	Eskom and iGas
2006-2007	<b>Guideline</b> for Scoping, Environmental Impact Assessment and Environmental Management Plans for mining in South Africa	Project leader and co-author	Dept of Minerals and Energy (DME), South Africa
2006	<b>Environmental Impact Assessment (EIA)</b> for the extension of the Port of Ngqura, Eastern Cape	Project Leader and co-author	Transnet
2006	<b>Integrating Sustainability Into Strategy: Handbook</b> (Version 1)	Project Leader and co-author	CSIR (STEP research report)
2005	<b>Technology Review</b> for the proposed aluminium smelter at Coega, South Africa	Project Leader and lead author	Alcan, Canada
2005	<b>Environmental and Social Impact Assessment (ESIA) report</b> for the proposed alumina refinery near Sosnogorsk, Komi Republic, Russia	Project manager and co-author	Komi Aluminium, Russia, IFC, EBRD
2005	<b>Guideline for Environmental Management Plans (EMPs)</b> for the Western Cape province, including conducting a training course for provincial government	Author	Dept of Environmental Affairs & Development Planning, Western Cape
2005	<b>Guideline for the review of specialist studies</b> undertaken as part of environmental assessments	Member of Steering Committee and project facilitator	Dept of Environmental Affairs & Development Planning, Western Cape
2004	<b>Review of Strategic Management Plan</b> for Table Mountain National Park (2001-2004)	Reviewer and co-author	South African National Parks
2004	<b>Strategic Needs Assessment Process</b> for mainstreaming sustainable development into business operations	Researcher and co-author	CSIR (internal research)
2004	<b>Environmental Monitoring Committees</b> booklet in the IEM Information Series for DEFFT	Contributing author	Department of Environmental Affairs and Tourism (DEFFT)
2004	<b>Overview of Integrated Environmental Management (IEM)</b> booklet in the IEM Information Series	Lead author and researcher	DEFFT
2003	<b>Environmental Screening Study</b> for gas power station, South Africa	Project Manager and lead author	Eskom, iGas and Shell
2003	<b>Environmental Management Programme (EMP) Framework</b> for the proposed Coega Aluminium Smelter; and assistance with preparing permit and licence applications	Project Manager and lead author	Pechiney, France
2003	<b>Environmental Management Plan</b> for the Operational Phase of the wetlands and canals at Century City, Cape Town	Project leader and lead author	Century City Property Owners' Association
2002	<b>Environmental Impact Assessment</b> for the proposed Pechiney aluminium smelter at Coega, South Africa	Project Manager and lead author	Pechiney, France
2002 - 2003	<b>Research project:</b> Ecological impact of large-scale groundwater abstraction on the Table Mountain Group aquifer	Project Manager	Water Research Commission
2002	<b>Environmental Management Plan</b> for the	Co-author	Eskom

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

Completion Date	1. Project description	Role	Client
	Eskom Wind Energy Demonstration Facility in the Western Cape		
2001-2002	<b>Environmental Impact Assessment</b> for the Eskom Wind Energy Demonstration Facility in the Western Cape	Quality control & co-author	Eskom
2001	<b>Environmental Due Diligence</b> study of four strategic oil storage facilities in South Africa	Project manager and co-author	SFF Association
2000	<b>Cape Action Plan for the Environment:</b> a biodiversity Strategy and Action Plan for the Cape Floral Kingdom - legal, institutional, policy, financial and socio-economic component	Project manager and contributing writer	World Wide Fund for Nature (WWF): South Africa
1999	<b>Environmental Management Plan</b> for the establishment phase of the wetlands and canals at Century City, Cape Town	Project manager and lead author	Monex Development Company
1999	<b>Environmental Management Programme</b> for the Thesen Islands development, Knysna	Process design and Co-author	Chris Mulder Associates Inc; Thesen and Co.
1999	<b>Management Plan for the coastal zone between the Eerste and Lourens River, False Bay, South Africa</b>	Project manager and lead author	Heartland Properties and Somchem (a Division of Denel)
1998	<b>Environmental Assessment</b> of the Mozal Matola Terminal Development proposed for the Port of Matola, Maputo, Mozambique	Project manager and author.	<i>SNC-Lavalin-EMS</i>
1998	<b>Strategic Environmental Assessment (SEA)</b> for the Somchem industrial complex at Krantzkop, South Africa	Project manager and co-author	Somchem, a Division of Denel
1997	<b>Strategic Environmental Assessment (SEA)</b> for the proposed Industrial Development Zone and Harbour at Coega, Port Elizabeth, South Africa	SEA project manager and report writer	Coega IDZ Initiative Section 21 Company
1996	<b>Environmental Impact Assessment</b> of Development Scenarios for Thesen Island, Knysna, South Africa	Project manager and report writer	Thesen and Co.
1996	<b>Environmental Impact Assessment</b> of the Management Options for the Bloulevi wetlands, Cape Town	Project manager and report writer	Ilco Homes Ltd (now Monex Ltd)
1995	<b>Environmental Impact Assessment</b> for the Saldanha Steel Project, South Africa	Report writing and management of specialist studies	Saldanha Steel Project
1994	<b>Environmental Impact Assessment</b> for the upgrading of resort facilities on Frégate Island, Seychelles	Member of the project management team, co-author, process facilitator	Schneid Israelite and Partners
1994	<b>Environmental Impact Assessment</b> for exploration drilling in offshore Area 2815, Namibia	Project manager and co-author	Chevron Overseas (Namibia) Limited
1994	<b>Management Plan</b> for the Rietvlei Wetland Reserve, Cape Town	Project manager and lead author	Southern African Nature Foundation (now WWF-SA)
1993	<b>Beach management plan</b> for Stilbaai beachfront and dunes, South Africa	Project manager and lead author	Stilbaai Municipality
1993	<b>Beach and dune management plan for Sedgefield</b> for the beach east of the mouth of the Swartvlei estuary	Project manager and lead author	Nel and De Kock Planners, George
1993	<b>Coastal Stability analysis and beach management plan</b> for the Table View coastline north of Blaauwberg Road, Cape Town	Project manager and lead author	Milnerton Municipality

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

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- Publication record A comprehensive list of publications, book chapters and contract reports is available upon request, with a summary provided below.
- Publications in journals, peer reviewed conference proceedings and CSIR internal research reports:*
- Weaver A, Pope J, Morrison-Saunders A & Lochner P, 2009, Contributing to sustainability as an environmental impact assessment practitioner, *Impact Assessment and Project Appraisal* (IAPA), 26:2, 91-98. (This paper received the IAPA best paper award for 2009).
- Lochner P, 2009: Case study - The role of environmental and social screening in informing the conceptual design and planning of large-scale projects in the pre-feasibility phase, in DBSA, 2009, *What works for us – a South African Country report for tactics, Tools and Methods for Integrating Environment and Development* (A South African Case study in partnership with the IED), pp 37-38, Midrand, South Africa.
- Lochner P, Munster F and Burns M, 2006. Integrating Sustainability into Strategy (ISIS): a process to inform sustainability strategies and frameworks, *In: IAIA South Africa Annual Conference proceedings*, South Africa.
- Rossouw N and Lochner P, 2006. Environmental Monitoring Committees (EMCs): purpose, function and structure. *In: IAIA South Africa Annual Conference proceedings*, South Africa.
- Munster F and Lochner P, 2006, Integrating Sustainability Into Strategy: Handbook (Version 1) – describing a process to inform sustainability strategies, frameworks and reports, *CSIR Report ENV-S-I 2005-001*, ISBN 0-7988-5560-6, Stellenbosch.
- Van Zyl H, de Wit M, Munster F, Lochner P, Gerber G, 2005. Economics in Environmental Impact Assessment: demystifying the theory and practice, *In: Conference Proceedings of the IAIA South Africa 2005 Annual National Conference*. South Africa.
- Lochner P, Weaver A, Gelderblom C, Peart R, Sandwith T and Fowkes S, 2003. Aligning the diverse: the development of a biodiversity conservation strategy for the Cape Floristic Region. *Biological Conservation Vol. 112, ISSN: 0006-3207*.
- Lochner P, Münster F, Msutu M, Wren S, 2003. The role of stakeholder engagement in the EIA for the Coega Aluminium Smelter. *In: Conference Proceedings of the IAIA South Africa 2003 Annual National Conference*. ISBN 1-919891-04-8. South Africa.
- Lochner P, Brooks W, Pesch P & Münster M. 2003, Stakeholder engagement process in the EIA of an aluminium smelter, Published in *Light Metals 2003* (Ed. Paul Crepeau), Published by TMS (the Minerals, Metals & Materials Society), ISBN Number 0-87339-531-X, USA.
- Rossouw N, Audouin M, Lochner P, Heather-Clark S and Wiseman K, 2000. Development of strategic environmental assessment in South Africa. *Impact Assessment and Project Appraisal*. Vol 18, no. 3, pp 217-223. United Kingdom.
- Lochner P and Fowkes S, 2000. Building partnerships for the conservation of the biodiversity of the Cape Floral Kingdom: experiences and lessons learnt from the Cape Action Plan for the Environment. *In: IAIA-SA Conference Proceedings 2000*. South Africa.
- Lochner P and Rossouw N, 1997. The development of an Environmental Management Plan for incorporating a wetland into a large mixed use development: the Century City example. *In: IAIA-SA Conference Proceedings 1997*. South Africa.



## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

### CV of Kelly Stroebel (Project Manager/EAP)

<b>Name of firm</b>	CSIR
<b>Name of staff</b>	Kelly Stroebel
<b>Profession</b>	Senior Environmental Assessment Practitioner
<b>Position in firm</b>	Senior Environmental Assessment Practitioner
<b>Years' experience</b>	6 years
<b>Nationality</b>	South African

### Biographical Sketch

Kelly holds a Bachelor of Science with Honours in Environmental Science from Rhodes University in Grahamstown and is currently pursuing a Masters at the University of Stellenbosch. Her undergraduate degree was a Bachelor of Science with majors in Environmental Science and Zoology. She is currently working as an environmental assessment practitioner at the Council for Scientific and Industrial Research (CSIR). Kelly has been the Project Manager of several EIA's in South Africa in the renewable energy and gas sector, and several Basic Assessments for the Special Needs and Skills Development Programme. She has assisted in the SIP projects including the National Wind & Solar Strategic Environmental Assessment (SEA) and Electricity Grid Infrastructure SEA as SEA which were commissioned by the national Department of Environmental Affairs.

### EMPLOYMENT TRACK RECORD

The following table presents a sample of the projects that Kelly Stroebel has been involved in to this date:

Completion Date	Project description	Role	Client
In progress	<b>EIA's in the South African energy sector</b>	Project Manager/EAP	Private energy companies and organs of state
In progress	<b>Special Needs and Skills Development Programme (DEFF-CSIR)</b>	Project Manager conducting Environmental services such as basic Assessments and Environmental Screening Studies.	Various SMME's and Community Trusts
2015	<b>Strategic Environmental Assessment (SEA) for Electricity Grid Infrastructure</b>	Project member-stakeholder engagement and project support.	National Department of Environmental Affairs
2015	<b>EIA for two proposed Desalination plants on the KZN coast.</b>	Project member- Public Participation Process, stakeholder engagement and project support.	Umgeni Water
August 2014	<b>National Strategy for Sustainable Development Review (NSSD1)</b>	Project member- research and report development.	National Department of Environmental Affairs
2013-2014	<b>Strategic Environmental Assessment (SEA) for roll out of photovoltaic solar and wind energy in South Africa.</b>	Project member- Stakeholder engagement and project support	National Department of Environmental Affairs

## SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

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### EMPLOYMENT RECORD

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- **2015 to present** Environmental Scientist and Assessment Practitioner. Council for Scientific and Industrial Research – Consulting and Analytical Services (CAS) - Stellenbosch
- **2014** Environmental Scientist and Assessment Practitioner (Intern). Council for Scientific and Industrial Research – Consulting and Analytical Services (CAS) - Stellenbosch

### QUALIFICATIONS/EDUCATION

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- BSc Hons. Environmental Science (Rhodes University, Grahamstown, South Africa)
  - Honours modules including Environmental Impact Assessment, Statistics, Climate Change Adaptation, Urban Ecology and Environmental Water Quality.
  - Honours thesis: “Water use and conservation by households of different economic status in King William’s Town”
- Bachelor of Science with Distinction (Rhodes University, Grahamstown, South Africa)
  - Undergraduate courses including Environmental Science, Zoology, Ichthyology, Chemistry, Earth Science, Botany and Computer Science.
- IEB Matric Certificate, 5 Distinctions (St Dominic’s Academy, Newcastle)

### TRAINING, CONFERENCES AND PROFESSIONAL REGISTRATIONS

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- Member of the Conference Organizing Committee (COC) for the IAIA Annual Conference 2017
- Project Management Practices and Principles with MS projects with the University of Pretoria: Distinction obtained (2016)
- Introduction to Earth Observation using ENVI with the University of Stellenbosch (2016)
- Public Participation Course with IAP2 (2016)
- Conflict Management Accredited through Conflict Dynamics (2015)
- Media and Science Training Accreditation through Jive Media Africa (2015)
- IAIA WC Workshop for Integrating Climate Change into EIA practice (2015)
- Presented on the DEFF-CSIR “Special Needs and Skills Development Programme” at the 2014 & 2015 Annual IAIA (International Association for Impact Assessment) South Africa Conference.
- Environmental Impact Assessment Training Course accreditation through Coastal and Environmental Services, Grahamstown (2012)
- DEFF&DP Training on the EIA Regulations (2014)
- Registered as a Candidate Natural Scientist with the South African Council for Natural Scientific Professions (SACNASP) (Reg #: 100151/14)
- Member of the South African Affiliate of the International Association for Impact Assessment (Membership no: 3588)

### LANGUAGE CAPABILITY

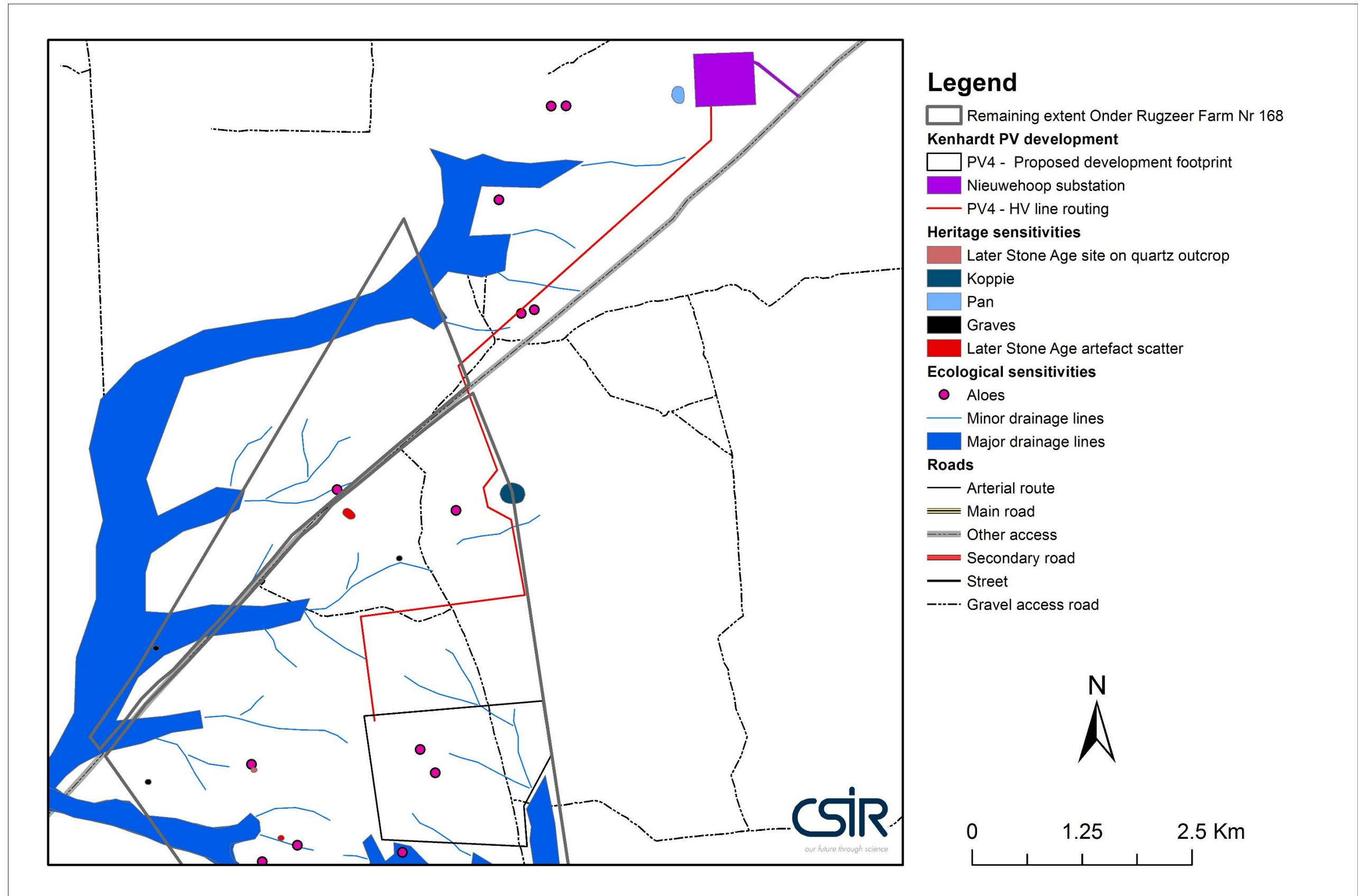
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<b>LANGUAGES</b>	<b>Speaking Reading</b>		<b>Writing</b>
English	Excellent	Excellent	Excellent
Afrikaans	Moderate	Moderate	Moderate

SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

11. APPENDIX C – ENVIRONMENTAL FEATURES MAP



SECTION F: APPENDICES

Basic Assessment for the for the Proposed Development of the Scatec Kenhardt Solar PV4 project and associated electrical infrastructure, Kenhardt, Northern Cape

12. APPENDIX D – ENVIRONMENTAL SENSITIVITY MAP (WITH FOOTPRINT OVERLAIN)

