

# OPERATIONS ENVIRONMENTAL MANAGEMENT PROGRAMME FOR THE DAMLAAGTE SOLAR PV FACILITY, FREE STATE PROVINCE

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## ACRONYMS AND ABBREVIATIONS

Acronym / Abbreviation	Definition
BA	Basic Assessment
BAR	Basic Assessment Report
BBBEE	Broad-Based Black Economic Empowerment
B.Sc.	Bachelor of Science
CA	Competent Authority
CARA	Conservation of Agricultural Resources Act, 1983 (No. 43 of 1983)
CR	Critically Endangered
DFFE	Department of Forestry, Fisheries and Environment (formerly Department of Environmental Affairs (DEA))
DWS	Department of Water and Sanitation (formerly Department of Water Affairs (DWA))
DM	District Municipality
DMRE	Department of Mineral Resources and Energy (formerly Department of Mineral Resources (DMR))
EA	Environmental Authorisation, i.t.o. NEMA
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioners Association of South Africa
EC	Electrical Conductivity
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIA Regulations, 2014	Environmental Impact Assessment Regulations, 2014 (GN R 982 of 2014, as amended by GN R 326 of 2017)
EIAR	Environmental Impact Assessment Report
EIS	Ecological Importance and Sensitivity
EMPr	Environmental Management Programme
GA	General Authorisation
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GN	Government Notice
HSEM	Health, Safety and Environmental Manager
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
MEC	Member of the Executive Council

Acronym / Abbreviation	Definition
M.Sc.	Master of Science
NAAQS	National Ambient Air Quality Standard
NAEIS	National Atmospheric Emission Inventory System
NDCR	National Dust Control Regulations, 2013
NDP	National Development Plan
NEMA	National Environmental Management Act, 1998 (No. 107 of 1998)
NEM: AQA	National Environmental Management: Air Quality Act, 2004 (No. 57 of 2003)
NEM:BA	National Environmental Management: Biodiversity Act, 2004 (No. 10 of 2004)
NEM: PAA	National Environmental Management: Protected Areas Act, 2003 (No. 57 of 2003)
NEM: WA	National Environmental Management: Waste Act, 2008 (No. 59 of 2008)
NFEPA	National Freshwater Ecosystem Priority Areas, 2011
NHRA	National Heritage Resources Act, 1999 (No. 25 of 1999)
NPAES	National Protected Areas Expansion Strategy
NWA	National Water Act, 1998 (No. 36 of 1989)
OM	Operations Manager
Pr.Sci.Nat.	Registered Professional Natural Scientists
R	Regulation
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resource Information System
SANBI	South African National Biodiversity Institute
SANS	South African National Standards
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
SHE	Safety, Health and Environment
SIA	Social Impact Assessment
SLR	SLR Consulting (South Africa) (Pty) Ltd
SPLUMA	Spatial Planning and Land Use Management Act, 2013 (No. 16 of 2013)
S&EIA	Scoping and Environmental Impact Assessment
WML	Waste Management Licence, i.t.o. NEM: WA
WUL	Water Use Licence, i.t.o. NWA
WULA	Water Use Licence Application

## 1. INTRODUCTION

This Operational Environmental Management Programme (OEMP) includes management measures for the operational activities that may have an impact on the environment from the 150 MW<sub>ac</sub> Damlaagte Solar PV Facility.

### 1.1 AIMS OF THIS DOCUMENT

The purpose of this EMPr is to ensure that impacts associated with the operation phase are avoided and, where they cannot be avoided, are kept to a minimum and rehabilitated. The EMPr, which has as its basis the mitigation measures listed in the EIA Report (EIAR), sets environmental targets for the Operator (or selected sub-contractors) and reasonable standards against which the Operator's performance can be measured during the operation phase.

This document will form the basis for the environmental specifications that the Operator will be obliged to adhere to during the operations of the facility. This document will be included in the contract documentation with selected sub-contractors for the operation phase and will thus form a binding agreement between the selected sub-contractors and the Operator (Mainstream).

### 1.2 STATUS OF THIS DOCUMENT

The development and implementation of environmental specifications is an on-going process that is iterative in nature. Any significant revisions to the EMPr document must be approved by the Department of Forestry, Fisheries, and the Environment (DFFE) before the EMPr is revised.

## 2. IMPLEMENTATION

### 2.1 ROLES AND RESPONSIBILITIES

The implementation of this EMPr requires the involvement of several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during the operation phase.

#### 2.1.1 Operator

Mainstream, as the Operator, is responsible for the implementation of the OEMP. The Operator will appoint the following:

- An **Operations Manager (OM)** shall be responsible for enforcing the OEMP and ensuring that appropriate mitigation measures are implemented at all work sites.
- A project **Health, Safety and HSEM (HSEM)** shall be the custodian of the Operator's EMS documentation and shall liaise with the OM and be responsible for the distribution and revision of the OEMP. The HSEM shall continuously monitor the implementation of this OEMP by performing regular inspections and audits. The HSEM shall conduct periodic environmental audits and advise the OM whenever this OEMP fails to achieve its goals and objectives.

The Operator shall ensure that all parties are aware of the requirements of the OEMP and monitor its implementation. Other key personnel, including the Field Engineers, Supervisors/Foremen and Sub-Contractor's Representatives, shall ensure that all personnel are aware of their responsibilities in terms of the OEMP.

## 2.2 WORKER INDUCTION

An induction programme, including a Code of Conduct, shall be developed for all workers directly related to the Project. A copy of the Code of Conduct is to be presented to all workers and signed by each person. The Code of Conduct must address the following aspects:

- respect for local residents and customs;
- zero tolerance of bribery or corruption;
- zero tolerance of illegal activities by personnel including:
  - unlicensed prostitution; illegal sale or purchase of alcohol; sale, purchase, or consumption of drugs; illegal gambling or fighting;
- a no alcohol and drugs policy during working time or at times that will affect ability to work; and
- description of disciplinary measures for infringement of the Code and company rules. If workers are found to be in contravention of the Code of Conduct, which they signed at the commencement of their contract, they will face disciplinary procedures that could result in dismissal.

The Project will develop and implement an HIV/AIDS policy and information document for all workers directly related to the Project. The information document will address factual health issues as well as behaviour change issues around the transmission and infection of HIV/AIDS.

## 2.3 ENVIRONMENTAL AWARENESS TRAINING

All personnel employed on the site or entering the site must attend an environmental awareness briefing. The extent of the briefing should be based on the length of time for which the person will be on site, the activities that they will be undertaking and the risks to which they will be exposed. All employees shall be made aware of the environmental risks relating to operational activities and specific site emergency plans.

## 2.4 DOCUMENTATION AND RECORD KEEPING

The Operator shall manage a complaints register (grievance mechanism) to record any environmental complaints relating to the operation of the facility. Details that should be recorded include the time, details of the complainant, the complaint specifics and follow-up action to be taken. Any complaints regarding environmental aspects of the operation should be investigated and documented.

The HSEM shall record the results of any environmental/ecological monitoring undertaken and note any occurrences of environmental incidents to enable analysis of long-term trends and to modify the OEMP specifications where necessary. These records shall provide evidence of progress made, identify areas of concern where further improvements are necessary and provide important information to management on business performance and exposure to risk. Environmental reports and records to be maintained shall include, but not limited to, the following:

- Bi-annual HSE Audit / Inspections Reports;

- Environmental Incident Reports as they occur; and
- Waste Disposal Tracking Records.

## 2.5 AUDITING

An internal review procedure shall be established by the Operator to monitor the implementation and compliance with the OEMP. The HSEM shall undertake the internal review. The HSEM shall advise the OM if this OEMP fails to achieve its goals and objectives. Corrective actions to rectify all non-conformances with the OEMP shall be included in the audit report.

Procedures that require modification shall be changed to improve the efficiency of the OEMP, where and when necessary. Any changes or adjustments to the OEMP shall be registered and included in an updated OEMP document. The updated OEMP shall be submitted to the Department of Forestry, Fisheries, and the Environment (DFFE) for approval.

Environmental inspections and monitoring will focus on activities that have a significant impact on the environment. The environmental monitoring and audit system shall be used as an important tool to measure the effectiveness of recommended mitigation measures. All environmental aspects and impacts resulting from the operation of the facility should be identified, managed, monitored and reported on regularly, e.g., stormwater and dust generation.

## 2.6 NON-COMPLIANCE

Any non-compliance with the specifications of the OEMP shall be identified and recorded by the HSEM and referred to the Operator. Follow up actions shall be identified as appropriate.

## 2.7 PUBLIC RELATIONS / STAKEHOLDER ENGAGEMENT

Public information boards shall be erected with contact details of the Operator and HSEM. The Operator shall keep a register of any complaints by members of the public. The register shall include all contact details of the person who made the complaint and information regarding the complaint itself.



### 3. ENVIRONMENTAL SPECIFICATIONS

Ref #	Project activity/aspect	Environmental Outcomes	Management Statement	Responsibility	Timing	Records/Indicators	Monitoring Requirements
3.1.1	<b>Management of Facilities</b> Building and Grounds Maintenance	Effective maintenance leading to the prevention of damage / pollution to the environment	<ul style="list-style-type: none"> <li>The discharge of pollutants to surface water, groundwater, and air from building and grounds maintenance shall be prevented. Pollutants would include detergents and paints used in maintenance operations;</li> <li>To prevent the discharge of hazardous waste into the stormwater system, signs should be erected in this regard at the drains. Any catch basins that receive runoff from maintenance areas should be cleaned regularly. These wastes should not be flushed into the stormwater drain, but removed in a proper manner;</li> <li>Effective precautions shall be taken not to use paint and detergents (and any similar materials) near stormwater conveyance systems;</li> <li>Adequate supplies of spill response equipment and materials should be stored near areas where spills may occur;</li> <li>Any significant structural maintenance should require compliance with the Construction EMP; and</li> <li>The maintenance contractor is to be made aware of the conditions under which maintenance is to be done.</li> </ul>	Operator	Daily, during operation	Clean construction areas.  Designated and well managed material storage areas.  External grievance/complaints procedure.  Photographs.	Site Inspections and Audits.
3.1.2	<b>Management of Facilities</b>	Damage / pollution to the environment is prevented	<ul style="list-style-type: none"> <li>Herbicides or other poisonous substances shall only be used on site with the prior knowledge and written consent of the OM and the HSEM; and</li> </ul>	Operator	Ad Hoc	Written permission from OM, or HSEM	Site Inspections and Audits.

Ref #	Project activity/aspect	Environmental Outcomes	Management Statement	Responsibility	Timing	Records/Indicators	Monitoring Requirements
	Use of herbicides, insecticides, and other pesticides		<ul style="list-style-type: none"> <li>Use of poisonous substances should be minimized and used according to directions.</li> </ul>				
3.1.3	<b>Management of Facilities</b> No-Go areas	Access to No-Go areas is prevented	<ul style="list-style-type: none"> <li>No-go areas include any areas outside of the fenced boundaries of the site; and</li> <li>The Operator shall ensure that operating activities do not impact on natural vegetation outside of the boundaries of the site.</li> </ul>	Operator	Ongoing, during operation	Clear demarcation of No-Go areas.  Photographs.	Site Inspections and Audits.
3.1.4	<b>Management of Facilities</b> Fuel storage tanks	Effective containment, handling, and storage of hazardous substances	<ul style="list-style-type: none"> <li>Used oil shall be collected and stored in a holding tank until removed from site by a specialist oil recycling company;</li> <li>Fuel where required shall be stored in a steel tank in a secure bunded area. Weekly monitoring of the bund wall and storage tanks should be undertaken to monitor for any leaks. Overfill protection and alarms should be installed to warn against possible overfilling which could lead to spills;</li> <li>The Operator shall provide adequate separating mechanisms, such as oil / water separators, to stop any spills and leaks from fuel storage areas entering the stormwater system. A dead-end sump shall be provided to capture spills and leaks;</li> <li>The Operator shall ensure that adequate fire-fighting equipment is made available at the fuel storage area;</li> </ul>	Operator	Daily, during operation	Adequate sump in place.  Suitable fire-fighting equipment and warning signage.  Training records.	Site Inspections and Audits.

Ref #	Project activity/aspect	Environmental Outcomes	Management Statement	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> <li>All fuel storage equipment should meet appropriate internationally recognised standards for structural design and integrity (e.g., American Petroleum Institute (API) standards 650, 652, 653 and 2610);</li> <li>Shutdown valves are to be installed (e.g., automatic pressure-activated valves) to shut down or isolate ruptured tanks; and</li> <li>All staff to be adequately trained in spill prevention, containment, and response.</li> </ul>				
3.1.5	<b>Management of Facilities</b> Traffic and parking	Safe traffic management	<ul style="list-style-type: none"> <li>Traffic on site shall be kept to a minimum. Only vehicles with permits issued by the Operator shall be allowed on site. Parking bays shall be provided for permit holders; and</li> <li>Pre-process and issue employees and business operators with tags to allow them to enter the controlled access point(s) with minimum delay.</li> </ul>	Operator	Daily, during operation	Permits for vehicles.	Site Inspections and Audits.
3.2.1	<b>Materials handling, use and storage</b> Transport	Safe passage of goods between destinations	<ul style="list-style-type: none"> <li>The Operator shall ensure that delivery drivers are informed of all procedures and restrictions in order to comply with the environmental requirements;</li> <li>Materials shall be appropriately secured to ensure safe passage between destinations. The Operator shall be responsible for any clean-up resulting from the failure by his employees or suppliers to properly secure transported materials;</li> <li>The Operator shall ensure that delivery drivers are supervised during on- and offloading;</li> </ul>	Operator	Daily, during operation	Contractor instructions to sub-contractors and suppliers.  Well-secured and covered loads (or no overfilled hauling trucks).  Photographs.	Site Inspections and Audits.

Ref #	Project activity/aspect	Environmental Outcomes	Management Statement	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> <li>To reduce air emissions, the Operator shall encourage the reduction in engine idling during on- and offloading activities;</li> <li>Vehicles at storage areas shall frequently be inspected for leaks of oils, hydraulic fluids, antifreeze, and other lubricants;</li> <li>Paved areas shall be inspected regularly, and cracks and joints sealed to stop the release of any contaminants to the underlying soils, and groundwater; and</li> <li>The Operator shall, as far as possible, ensure that transport of abnormal loads does not disrupt normal traffic flow and shall notify other road users in advance of any disruption due to the transport of such loads.</li> </ul>				
3.2.2	<b>Materials handling, use and storage</b> Storage/stockpiling	Damage to sensitive environments is avoided	<ul style="list-style-type: none"> <li>All fuel, oil and other hazardous substances shall be confined to demarcated, adequately bunded areas and stored in suitable containers;</li> <li>All storage areas for chemicals and paints shall be bermed and raised above the surrounding ground surface to minimise run-on of stormwater and to contain any leaks and spills;</li> <li>Chemical storage areas shall be covered and designed to allow easy collection of spills and leaks. Where required, flame resistant storage containers shall be provided;</li> <li>Temporary storage areas shall be kept away from high traffic areas and shall be clearly marked noting the materials stored, emergency contact details, and spill clean-up procedures;</li> </ul>	Operator	Daily, during operation	Well-managed and placed construction material.  Suitable number of hydrocarbon spill clean-up kits.  Photographs.	Site Inspections and Audits.

Ref #	Project activity/aspect	Environmental Outcomes	Management Statement	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> <li>The Operator shall ensure that incompatible materials (paints &amp; chemicals) are not stored together;</li> <li>Spill response materials shall be stored in strategic locations for use in any location on site and shall be clearly marked;</li> <li>Drip trays shall be used under fuel hoses and dispensing equipment at all times;</li> <li>The Operator shall ensure that run-off from any fuel or hazardous material storage area does not contaminate seawater; and</li> <li>The HSEM shall conduct frequent inspections of storage and handling areas. Consistent and accurate records of inspection efforts, spills and leaks, and clean-up efforts shall be kept.</li> </ul>				
3.2.3	<b>Materials handling, use and storage</b> Hazardous substances	Spillages of hazardous substances are avoided	<ul style="list-style-type: none"> <li>The Operator shall ensure that all toxic/hazardous products (i.e., fuel, poisons, bitumen etc.) are stored and handled in a manner that minimises the potential for spillage;</li> <li>The Operator must ensure that all hazardous substances are stored in a bunded area and that containers are properly labelled;</li> <li>The relevant Material Safety Data Sheets (MSDSs) for all hazardous chemical substances (as defined in the Occupational Health &amp; Safety Act 85 of 1993, Regulations for Hazardous Chemical Substances) shall be on site. Procedures detailed in the MSDSs shall be followed in the event of an emergency situation;</li> </ul>	Operator	Daily, during operation	Suitable hazardous substances storage areas.  Adequate warning sign and fire-fighting equipment.  MSDS for all hazardous substances on site.	Site Inspections and Audits.

Ref #	Project activity/aspect	Environmental Outcomes	Management Statement	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> <li>• Any accidental spill of oils or chemicals is to be reported to the HSEM immediately so that the best remediation method can be quickly implemented;</li> <li>• Spills of hazardous substances into the soil or any water body is also to be reported to all relevant authorities, including DESTEA, within 14 days. This requirement is in terms of Section 30 (10) of NEMA and Section 20 (3) of the National Water Act, No. 36 of 1998 (NWA) that pertains to the control of emergency incidents;</li> <li>• Copies of all MSDSs shall be sent to the clinic that will be used by the Operator in case of any emergency situation;</li> <li>• The Operator shall familiarise themselves with all relevant local by-laws and regulations concerning the storage of hazardous substances, and shall adhere to these by-laws and regulations;</li> <li>• Preventative procedures for minor hydrocarbon spills of oil and other hazardous substances shall include the following:                         <ul style="list-style-type: none"> <li>○ Using drip trays for collection of waste lubricants during equipment maintenance;</li> <li>○ Immediate cleaning with appropriate absorbent granules and powders;</li> <li>○ Using environmental contingency response drums;</li> <li>○ Using bunded storage areas;</li> <li>○ Identifying potential leak points on storage containers;</li> </ul> </li> </ul>			<p>Incident Reports.</p> <p>Photographs.</p>	

Ref #	Project activity/aspect	Environmental Outcomes	Management Statement	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> <li>○ Excavation of spoiled soil and replacement with new earth;</li> <li>○ Providing covered containers for chemicals used on a routine basis;</li> <li>○ Returning of contaminated chemicals such as paints or thinners to the manufacturers;</li> <li>○ Orientation of personnel on the safe handling of chemicals; and</li> <li>○ Routine inspection of chemical storage facilities and areas by the HSEM.</li> </ul>				
3.3.1	<b>Waste Management</b> Solid waste	Contamination of the environment as a result of waste management is avoided	<ul style="list-style-type: none"> <li>● Solid waste includes all waste from operational activities and surplus food, food packaging, organic waste, etc. The Operator shall be responsible for the establishment of a solid waste control and removal system to prevent the spread of waste in, and beyond, the operation site;</li> <li>● An integrated waste management approach shall be used, based on the principles of waste minimisation, reduction, reuse, and recycling of materials. This policy shall be included in the Environmental Awareness Training sessions. Containers for glass, paper, metals, and plastics shall be provided. Office areas are particularly suited for this purpose;</li> <li>● All waste bins must have lids and be suitably wind-proof, being made of a durable, appropriate material. Bins are to be located at all areas of the site used by the Operator, with waste to be removed from the waste bins on a regular basis;</li> </ul>	Operator	Daily, during operation	Proof of suitably licensed waste disposal and recycling facilities used.  No litter around site.  Presence of suitably designed waste bins.  Suitably designed waste storage areas.	Site Inspections and Audits.  Monthly general waste reconciliation.

Ref #	Project activity/aspect	Environmental Outcomes	Management Statement	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> <li>The Operator shall ensure that the site is kept clean at all times. The general cleanliness of the site shall form part of the HSEM’s inspections;</li> <li>All waste shall be stored in a demarcated area, which meets the satisfaction of the HSEM;</li> <li>No waste material or litter shall be burnt or buried on site; and</li> <li>No waste shall be allowed to accumulate or be stored on site for longer than 30 days.</li> </ul>			<p>No signs of on-site waste disposal / burning.</p> <p>Photographs.</p>	
3.3.2	<b>Waste Management</b> Hazardous waste	Contamination of the environment as a result of waste management is avoided	<ul style="list-style-type: none"> <li>Hazardous waste must be stored in suitable containers and containers must be clearly labelled;</li> <li>The Operator shall ensure that all hazardous waste is collected by an approved waste contractor and disposed of at a licensed hazardous waste site;</li> <li>No hazardous waste shall be allowed to enter into stormwater drains; and</li> <li>No hazardous waste shall be allowed to accumulate or be stored for longer than 30 days.</li> </ul>	Operator	Daily, during operation	<p>Approved MS is for management of hazardous waste.</p> <p>Suitable containment of stored hazardous waste.</p> <p>Proof of suitably licensed hazardous waste transporters used.</p> <p>Proof of suitably licensed waste disposal and recycling facilities used.</p>	Site Inspections and Audits.



Ref #	Project activity/aspect	Environmental Outcomes	Management Statement	Responsibility	Timing	Records/Indicators	Monitoring Requirements
						No signs of on-site waste disposal/burning.  Photographs.	
3.3.3	<b>Waste Management</b> Recording keeping	Effective waste management and monitoring	<ul style="list-style-type: none"> <li>Waste generated must be classified and the volume of hazardous waste produced recorded; and</li> <li>Waste disposal tracking records shall also be kept to trace the transport of waste from site to a registered landfill or hazardous waste site.</li> </ul>	Operator	Daily, during operation	Records of general waste types, volumes and disposal sites used.  Safe disposal certificates for each load of waste oil and hazardous waste taken off site.	Site Inspections and Audits.  Monthly waste reconciliation.
3.3.4	<b>Waste Management</b> Appointment of waste contractor	Effective waste management	<ul style="list-style-type: none"> <li>The waste contractor appointed by the Operator must be approved by Mainstream. The Operator shall provide Mainstream with the following information before a waste contractor is licensed to operate at the site:                             <ul style="list-style-type: none"> <li>name of the contractor;</li> <li>a copy of the valid license or proof of registration;</li> <li>nature of waste that the contractor will be handling;</li> <li>procedures for disposal of kinds of waste that the contractor will be handling; and</li> </ul> </li> </ul>	Operator	Ad Hoc	Waste contractor registration documentation.  Approval by Mainstream (if applicable)	Site Inspections and Audits.

Ref #	Project activity/aspect	Environmental Outcomes	Management Statement	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> <li>○ location of waste disposal facility that the contractor will use.</li> </ul>				
3.5	<b>Waste or contaminated water</b>	Contamination of the environment as a result of waste or wastewater is prevented	<ul style="list-style-type: none"> <li>● The Operator shall prevent pollution of groundwater that could result from operational activities. Such pollution could result from the release, accidental or otherwise of chemicals, oils, fuels, cement, sewage, water carrying product, etc. as a result of operations;</li> <li>● The Operator shall ensure that no contaminated surface water shall flow off-site as a result of operations;</li> <li>● Silt/oil traps shall be maintained to ensure retention of silt/oil on site and cut-off ditches shall be managed to ensure no run-off from the site except at points where silt/oil traps are provided;</li> <li>● The Operator shall be responsible for the operation of necessary collection facilities in order to prevent pollution and to allow for settlement of suspended matter;</li> <li>● Solids from the settlement pond shall be disposed of at a licensed landfill site on a regular basis in a manner approved by the OM and HSEM;</li> <li>● Runoff from the workshop area shall be directed into a conservancy tank and disposed of at a location approved by the HSEM and local authority; and</li> <li>● No waste- or contaminated water shall be disposed of into the stormwater drains.</li> </ul>	Operator	During operation	Records of collection and disposal of wastewater.  No signs of wastewater disposal to the environment.  Presence of silt/oil traps,  Proof of suitably licensed waste facilities used for wastewater.  Photographs.	Site Inspections and Audits.  Monthly wastewater reconciliation.

Ref #	Project activity/aspect	Environmental Outcomes	Management Statement	Responsibility	Timing	Records/Indicators	Monitoring Requirements
3.6.1	<b>Control of operational impacts</b> General aesthetics	Significant visual impacts are prevented	<ul style="list-style-type: none"> <li>The Operator shall take reasonable measures to ensure that operational activities do not have an unreasonable impact on the aesthetics of the area.</li> </ul>	Operator	During operation	Procedure for recording and managing external grievance / complaints, and complaints register.	Site Inspections and Audits.
3.6.2	<b>Control of operational impacts</b> Noise control	Noise disturbance to neighbouring properties is avoided or minimised	<ul style="list-style-type: none"> <li>The Operator shall be familiar with all relevant local by-laws and regulations concerning noise and working hours, and shall adhere to these by-laws and regulations;</li> <li>Once working hours have been confirmed, the Operator shall negotiate for any permits requiring deviation from local by-laws and/or regulations with the relevant Municipality;</li> <li>The Operator shall advise the HSEM in writing of such intention prior to negotiating for these permits;</li> <li>The Operator shall be held responsible for any complaints received from the authority and/or public with respect to any contravention of the agreed conditions;</li> <li>Employees shall be provided with the necessary personal protection equipment where required; and</li> <li>Noise levels of audible warning devices are to be kept to the minimum necessary for the health and safety of employees.</li> </ul>	Contractor	Ad hoc	Procedure for recording and managing external grievance / complaints, and complaints register.  Noise monitoring results.  Agreements with the HSEM and local authority (as required).	Site Inspections and Audits.  Noise monitoring in accordance with SANS 10103.

Ref #	Project activity/aspect	Environmental Outcomes	Management Statement	Responsibility	Timing	Records/Indicators	Monitoring Requirements
3.6.3	<b>Control of operational impacts</b> Lighting management	Disturbance to surrounding community is minimised or avoided	<ul style="list-style-type: none"> <li>The Operator shall ensure that no unnecessary lights are left on after working hours;</li> <li>Spill off lighting must be used to limit light pollution; and</li> <li>The Operator shall ensure that any lighting installed on the site shall be aimed away from the N1 and R59 road and areas south and west of the site.</li> </ul>	Operator	During operation	External Grievance/ Complaints procedure and register.	Site Inspections and Audits.
3.6.4	<b>Control of operational impacts</b> Fire management	Effective fire prevention and control	<ul style="list-style-type: none"> <li>The Operator shall take all reasonable steps to avoid fire risks through their activities on site;</li> <li>The Operator shall ensure that there is basic fire-fighting equipment on site at all times. This equipment shall include fire extinguishers and beaters;</li> <li>The Operator shall ensure that the fire-fighting equipment is to the satisfaction of the Vaal-Eden Fire Fighters Association and / or Local Fire Services; and</li> <li>The Operator shall pay the costs incurred by an organisation called to put out fires started by himself or any sub-contractor.</li> </ul>	Contractor	Daily	Adequate fire-fighting equipment.	Site Inspections and Audits.
3.6.5	<b>Control of operational impacts</b> Protection of flora and fauna	Damage and disturbance to flora and fauna is prevented or minimised	<ul style="list-style-type: none"> <li>No activities shall take place outside the demarcated operational areas;</li> <li>No additional habitat is to be disturbed during the operational phase of the development;</li> <li>The removal, damage or disturbance of natural vegetation, fauna or avifauna is forbidden outside of the demarcated site boundaries;</li> </ul>	Operator	During operation	No signs of unnecessary vegetation removal or hunting, trapping, shooting, poisoning of fauna.	Site Inspections and Audits.

Ref #	Project activity/aspect	Environmental Outcomes	Management Statement	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> <li>The Operator shall be familiar with any Ordinances, Acts, by-laws, and regulations pertaining to the protection of natural features, flora, and fauna on site; and</li> <li>Where applicable, the Operator shall apply for the necessary permits prior to removing any animals or plants listed in the relevant schedules promulgated in terms of any relevant legislation.</li> <li>No vehicles are allowed to indiscriminately drive through sensitive habitat and natural areas;</li> <li>No dumping of litter must be allowed on-site; and</li> <li>No activities shall take place outside the demarcated operational areas.</li> </ul>			Permits for the removal of flora or fauna (if applicable).	
3.6.6	<b>Control of operational impacts</b> Protection of avifauna	Prevent the mortality of Red Data Species	<ul style="list-style-type: none"> <li>Reactive mitigation of hardware if electrocutions of Red Data species are recorded.</li> </ul>	Operator	During operation	Low number of electrocuted Red Data species are recorded.	Site Inspections and Audits.
3.6.7	<b>Control of operational impacts</b> Management of Alien Plant species	Minimise the establishment and spread of alien invasive plants	<ul style="list-style-type: none"> <li>Edge effects arising from the facility, such as erosion and alien plant species proliferation, which may affect adjacent natural areas, need to be strictly managed. Specific mention in this regard is made of Category 1b and 2 AIP species (as listed in the NEMBA Alien species lists, 2020), in line with the NEMBA Alien and Invasive Species Regulations (2020) (section 3.5.3 of the Terrestrial Ecology Report);</li> </ul>	Operator	During operation	Low abundance of AIPs	On-going monitoring of the area by the Operator / HSEM.  Site Inspections by the Operator / HSEM.  Annual Audit of by a Botanist.

Ref #	Project activity/aspect	Environmental Outcomes	Management Statement	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> <li>Ongoing alien and invasive plant monitoring and clearing / control should take place throughout the operational and maintenance phase, and the project perimeters should be regularly checked for AIP establishment to prevent spread into surrounding natural areas; and</li> <li>Alien vegetation that is removed must not be allowed to lay on unprotected ground as seeds might disperse upon it. All cleared plant material to be disposed of at a licensed waste facility, which complies with legal standards.</li> </ul>				Location of any AIPs within the project footprint and the vicinity are logged on a GPS
3.8.1	<b>Control of operational activities</b> Plant / equipment repair and maintenance	Contamination of the environment as a result of maintenance activities is prevented	<ul style="list-style-type: none"> <li>The Operator shall ensure that all equipment is on a planned maintenance programme and is maintained in an operational condition at all times;</li> <li>An equipment inventory, per type of equipment or machinery, shall be kept ensuring that all inspections and tests are undertaken;</li> <li>All repair and maintenance of plant and equipment shall take place in designated workshop areas;</li> <li>The Operator shall ensure that workshop areas are kept neat and clean at all times;</li> <li>When servicing vehicles and equipment, drip trays shall be used to collect waste oil and other lubricants; and</li> <li>All washing of vehicles and equipment shall be undertaken in suitable maintenance areas equipped with an impermeable floor and sump / oil trap to prevent the run-off of fuel, oil, and lubricants.</li> </ul>	Operator	During operation	Equipment maintenance schedule.  Equipment inventory.  Spare drip trays available.  No signs of washing of equipment/ vehicles in the field.  Incident Reports.  Photographs.	Site Inspections and Audits.

Ref #	Project activity/aspect	Environmental Outcomes	Management Statement	Responsibility	Timing	Records/Indicators	Monitoring Requirements
3.8.2	<b>Control of operational activities</b> Solar PV facility operation and maintenance	Effective maintenance of the solar PV facility and associated infrastructure	<ul style="list-style-type: none"> <li>The Operator shall operate the solar PV facility and the associated infrastructure in accordance with the standards of a recognised international Code of Practice for the Operation and Maintenance of Solar PV Facilities,</li> <li>The Operator shall prepare a Maintenance Plan for the operation of the solar PV facility and associated infrastructure. This plan shall meet the relevant codes of practice and guidelines, but not limited, to the following:                             <ul style="list-style-type: none"> <li>Detailed instructions for employees covering maintenance procedures for the solar PV facility and associated infrastructure (i.e., on-site substation and BESS, etc) during normal operations and repairs; and</li> <li>Particular reference to those portions of the solar PV facility and the associated infrastructure (i.e., BESS, etc.) presenting the greatest hazard to the public in the event of an emergency or because of extraordinary maintenance requirements.</li> </ul> </li> </ul>	Operator	During operation	Approved Maintenance Plan.  Training records.	Site Inspections and Audits.
3.9	<b>Emergency procedures</b>	Effective response in the event of emergencies	<ul style="list-style-type: none"> <li>The Operator shall implement an Emergency Response Plan which addresses all potential incidents and risk sources of its operations. The plan must be developed in consultation with the local authority and should take into consideration any plans developed by the local authority in this regard.</li> </ul>	Operator	During operation	Approved Emergency Response Plan.  Incident Reports.	Site Inspections and Audits.

Ref #	Project activity/aspect	Environmental Outcomes	Management Statement	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> <li>All abnormal and emergency incidences must be investigated and be reported to the relevant authorities in terms of Section 30 of the National Environmental Management Act, 1998 (Act 107 of 1998), as amended.</li> <li>The Operator shall ensure that staff and the staff of Subcontractors are aware of the procedure to be followed for dealing with spills and leaks;</li> <li>In the event of a major spill (more than 220 litres) the OM and HSEM shall be notified;</li> <li>The Operator shall ensure that the necessary materials and equipment for dealing with spills and leaks are present on site at all times;</li> <li>The clean-up of spills and any damage caused by the spill or leak shall be for the Operator's account. The 'polluter pays' principal shall be employed for any accidental spills and leaks;</li> <li>Treatment and remediation of spill areas shall be undertaken to the satisfaction of the OM and the HSEM;</li> <li>Spill cleaning materials shall be provided at each fuel and other liquid hazardous substance storage areas;</li> <li>Appropriate fire-fighting equipment shall also be provided at each storage area; and</li> <li>Emergency drills shall be conducted regularly in order to familiarise personnel with their roles and responsibilities in emergency response.</li> </ul>			<p>Proof of notification to OM and HSEM (in the event of a major spill).</p> <p>Hydrocarbon spill kits readily available.</p>	



Ref #	Project activity/aspect	Environmental Outcomes	Management Statement	Responsibility	Timing	Records/Indicators	Monitoring Requirements
3.10	<b>Decommissioning of the solar PV facility</b>	Successful decommissioning of the solar PV facility	<ul style="list-style-type: none"> <li>The Operator shall prepare a Decommissioning Plan for submission to the competent authority, at least one year ahead of decommissioning. The appropriate authorities and legislation that must be complied with shall be those applicable at the time; and</li> <li>The Operator in consultation with the surrounding Landowners, shall determine whether there are any practical options to re-use the land affected by the proposed project prior to abandonment. These shall be discussed with the regulatory authority(s).</li> </ul>	Operator	One year prior to decommissioning	Pipeline Decommissioning Plan.  Proof of consultation with Landowners	Site Inspections and Audits.





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