

**ENVIRONMENTAL IMPACT ASSESSMENT
FOR THE PROPOSED DE AAR SOLAR ONE
PHOTOVOLTAIC POWER PROJECT,
NORTHERN CAPE**

**ENVIRONMENTAL MANAGEMENT
PROGRAMME**

Prepared for:
Department of Environmental Affairs

On behalf of:
Business Venture Investments 1421 (Pty) Ltd

Prepared by:
CCA Environmental (Pty) Ltd



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Prepared for:
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On behalf of:
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PREFACE

Business Venture Investments 1421 (Pty) Ltd is proposing to develop the De Aar Solar One Photovoltaic Power Project on Portion 3 of Farm Hartebeestplaats 135 (see Figure 1). In summary, the proposed photovoltaic power plant would consist of a 25 to 30 megawatt peak alternating current (MWp AC) plant (capacity is subject to the final choice of technology). The proposed plant would be connected to the existing Eskom Hydra substation via a 132 kilovolt (kV) overhead power line of approximately 2 to 2.5 km long.

In terms of the Environmental Impact Assessment (EIA) Regulations 2010 an Environmental Management Programme (EMP) must be prepared for the proposed project, which addresses all phases of the proposed development. The scope of environmental management described in this EMP pertains to the entire development proposal and has been divided into two volumes, namely:

- Volume 1: Construction Environmental Management Programme; and
- Volume 2: Operation Environmental Management Programme.

This EMP has as its basis the recommendations listed in the Final Environmental Impact Report (EIR), associated specialist studies and specifications requested by the Department of Environmental Affairs (DEA). It is important to note that the development and implementation of environmental specifications is an on-going process that is iterative in nature. This document is thus the first version of the EMP for the proposed project.

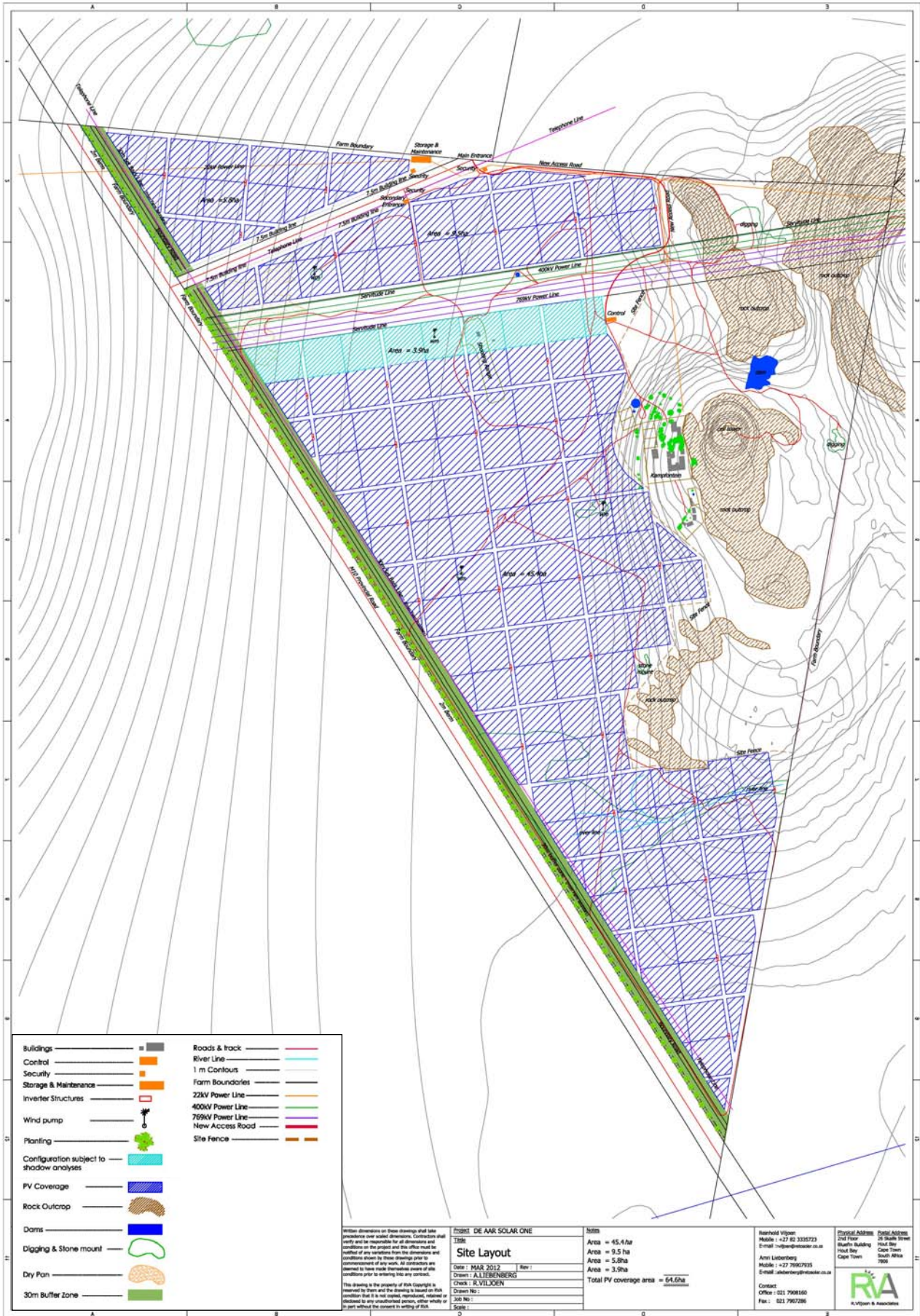



Figure 1: Proposed layout for the photovoltaic power plant on Farm Hartebeestplaats 135/3.

PROJECT INFORMATION

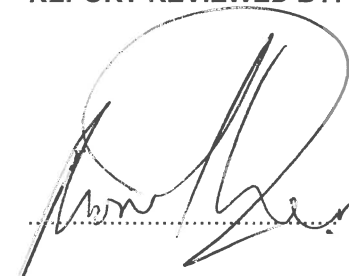
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ENVIRONMENTAL CONSULTANTS	CCA Environmental (Pty) Ltd
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VOLUME 1:

**CONSTRUCTION ENVIRONMENTAL
MANAGEMENT PROGRAMME**

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List of acronyms:

DEA	Department of Environmental Affairs
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
ELM	Emthanjeni Local Municipality
EMC	Environmental Monitoring Committee
EMP	Environmental Management Programme
EO	Environmental Officer
RE	Resident Engineer
SAHRA	South African Heritage Resources Agency

GLOSSARY OF TERMS

The definitions given below are for explanatory purposes only and are applicable to this Environmental Management Programme. In the event that any conflict arises between the definitions contained herein and those contained within the contract documentation, those within the contract documentation shall prevail.

ALIEN INVASIVE PLANTS: Plants that do not naturally occur in an area. These plants may also be referred to as exotic plants, e.g. Port Jackson (*Acacia saligna*) and Rooikrans (*Acacia cyclops*).

CONSTRUCTION ACTIVITY: A Construction Activity is any action taken by the Contractor, his Sub-Contractors, suppliers or personnel during the construction phase and operational phase of the project.

CONSTRUCTION CAMP: Construction camp refers to all site offices, staff accommodation, container sites, workshops and testing facilities.

ENVIRONMENT: The external circumstances, conditions, and objects that affects the existence and development of an individual, organism or group. These circumstances include biophysical, social, economic, historical, cultural and political aspects.

ENVIRONMENTAL MANAGEMENT: That part of the overall management process which seeks to ensure, as far as possible, that no avoidable impact is caused to the environment and that when this is unavoidable that the consequences are understood prior to the impact being caused and that the impact is then mitigated as far as possible.

ENVIRONMENTAL MANAGEMENT PROGRAMME: That part of the overall management process which includes organisational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy.

ERADICATION PROGRAMME: The clearing and rehabilitation of land infested by invasive alien plant species.

GROUNDWATER: The water that fills the natural openings present in the rock or unconsolidated sands.

HAZARDOUS: Contains an element of risk. Dangerous or toxic to life.

HAZARDOUS SUBSTANCES: This means any substance or mixture of substances, product or material declared to be a hazardous substance under section 2(1) of the Hazardous Substance Act (1973).

HERBICIDE: See 'Pesticide'.

INVASIVE SPECIES: See 'Alien invasive species'.

MAINTENANCE: The complete upkeep, support and protection of areas/regions/sites.

METHOD STATEMENTS: Written statements which contain details regarding construction procedures, materials (where applicable), timing, storage methods (where applicable) and sketches of proposed construction. Method Statements shall be submitted for work near environmental sensitive regions of the site. This includes environmentally sensitive aspects of the work such as construction camp location and layout, site clearing, use of hazardous substances, solid waste management, wastewater management, erosion and sediment control, fire control, dust control and cement and concrete batching.

MITIGATION: The implementation of practical measures to reduce adverse impacts or enhance beneficial impacts.

NO-GO AREA: Areas where construction activities are prohibited are referred to as no-go Areas.

PESTICIDE: Pesticides are chemicals used to kill organisms that threaten health and well-being, pets and livestock or cause damage to crops. This includes insecticides, herbicides, fungicides, acaricides, nematocides and rodenticides.

POLLUTION: Any change in the environment caused by substances, radioactive or other waves; or noise, odours, dust or heat, emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future.

REHABILITATION: To re-establish or restore to a healthy sustainable capacity or state.

SITE: The 'site' refers to the cadastral entity(ies) awarded to the Contractor and any other area reasonably required by the Contractor to undertake the construction activities in order to fulfil the contract.

1. AIMS OF THE CONSTRUCTION EMP

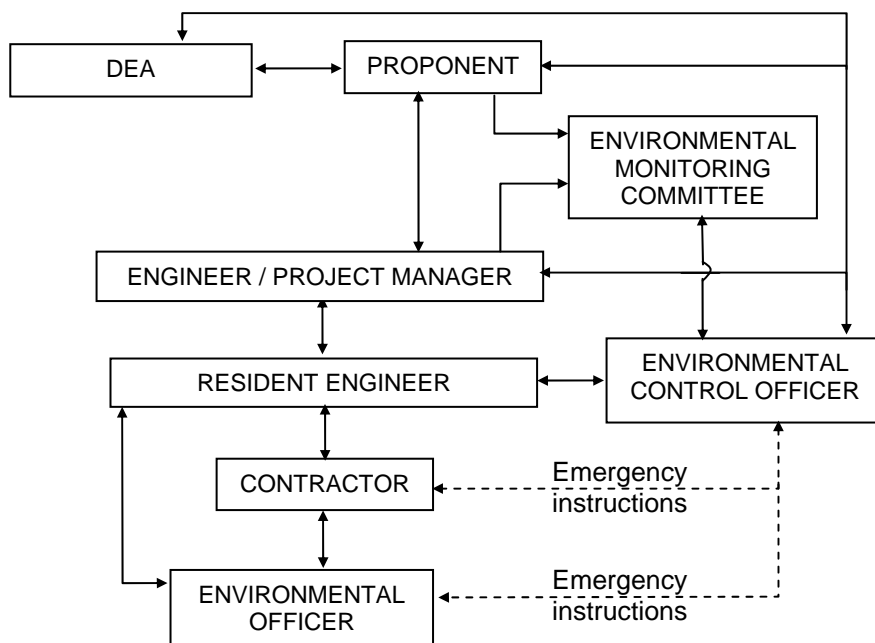
The purpose of the Construction EMP is to ensure that impacts on the environment associated with the construction phase are prevented and, where they cannot be prevented, are kept to a minimum and rehabilitated. The Construction EMP sets environmental targets for the Contractor (and any Sub-contractors) and reasonable standards against which the Contractor's performance can be measured during the construction phase.

This document will form the basis for the environmental specifications that the Contractor, in terms of the construction contract, will be obliged to adhere to during construction. This document will be included in the contract documentation for the construction phase and will thus form a binding agreement between the Contractor and the Proponent (Business Venture Investments 1421 (Pty) Ltd).

2. ADMINISTRATION AND REGULATION OF ENVIRONMENTAL OBLIGATIONS

2.1 MANAGEMENT STRUCTURE

Details of the management structure for this Construction EMP are presented below. All official communication and reporting lines including instructions, directives and information shall be channelled according to the management structure presented below.



2.1 ROLES AND RESPONSIBILITIES

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

2.1.1 DEPARTMENT OF ENVIRONMENTAL AFFAIRS

The Department of Environmental Affairs (DEA) is the designated authority responsible for authorising this Construction EMP and has overall responsibility for ensuring that the Proponent complies with this Construction EMP and any conditions listed in the Environmental Authorisation should the project be approved.

DEA shall also be responsible for approving any amendments that may be required to the Construction EMP. DEA may also perform random site inspections to check compliance with the Construction EMP.

2.1.2 PROPONENT

The Proponent is ultimately responsible for the implementation of the Construction EMP and the financial cost of all environmental control measures. The Proponent must ensure that any person acting on their behalf complies with the conditions / specifications contained in this Construction EMP. The Proponent is also responsible for the appointment of a Project Manager / Engineer, Contractor and Environmental Control Officer (ECO).

The Proponent shall address any site problems pertaining to the environment at the request of DEA, Project Manager / Engineer and / or ECO.

2.1.3 ENGINEER OR PROJECT MANAGER

The Engineer or Project Manager shall oversee the planning, design and construction phases of the project. The Project Manager or Engineer shall appoint a Resident Engineer (RE) to act as on-site implementing agent. In the situation where no Engineer is appointed, the Project Manager shall appoint a Resident Project Manager to act as on-site implementing agent. For the purposes of this document the term Engineer will be used interchangeably with Project Manager. Similarly, "RE" will be used interchangeably with Resident Project Manager.

The Engineer shall address any site problems pertaining to the environment at the request of the RE and/or the ECO. The Engineer shall also be responsible for issuing penalties for contravention of the Construction EMP.

2.1.4 CONTRACTOR

The Contractor shall have the following responsibilities:

- To implement all provisions of the Construction EMP. If the Contractor encounters difficulties with specifications, he / she must discuss alternative approaches with the RE and/or the ECO prior to proceeding.
- To ensure that all staff and Sub-Contractors are familiar with the Construction EMP.

- To make personnel aware of environmental issues and to ensure they show adequate consideration of the environmental aspects of the project.
- To prepare the required Method Statements (see Section 2.5).
- To report any incidents of non-compliance with the EMP to the RE and/or the ECO.
- To rehabilitate any sensitive environments damaged due to the Contractor's negligence. This shall be done in accordance with the RE's and ECO's specifications.

Failure to comply with the Construction EMP may result in fines (see Section 2.10) and reported non-compliance may result in the suspension of work or termination of the contract by the Engineer.

2.1.5 RESIDENT ENGINEER

The RE shall act as the Proponent's on-site implementing agent and has the responsibility to ensure that Proponent's responsibilities are executed in compliance with the Construction EMP. Any on-site decisions regarding environmental management are ultimately the responsibility of the RE. The RE shall assist the ECO where necessary and shall have the following responsibilities in terms of the implementation of this Construction EMP:

- Reviewing and approving the Contractor's Method Statements with input from the ECO where necessary.
- Monitoring and verifying that the Construction EMP and Method Statements are adhered to at all times and taking action if specifications are not followed.
- Keeping a photographic record of construction activities on site.
- Assisting the Contractor in finding environmentally responsible solutions to problems with input from the ECO where necessary.
- Ordering the removal of person(s) and/or equipment not complying with the Construction EMP specifications.
- Issuing spot fines for transgressions of site rules of the Construction EMP.
- Delaying any construction activity if he/she believes the environment has been or is likely to be seriously harmed / impacted.
- Providing input into the ECO's ongoing internal review of the Construction EMP.
- Communicating environmental issues to the Environmental Officer.

2.1.6 ENVIRONMENTAL CONTROL OFFICER

The ECO's duties shall include, *inter alia*, the following:

- Reviewing Method Statements (see Section 2.5).
- Advising the Contractor and / or the RE on environmental issues within defined construction areas.
- Undertaking regular site visits to ensure compliance with the Construction EMP and verifying that environmental impacts are kept to a minimum throughout the contract.
- Completing environmental checklists during site visits.
- Keeping a photographic record of progress on site from an environmental perspective.
- Assisting the Contractor and / or the RE in finding environmentally acceptable solutions to construction problems.
- Recommending additional environmental protection measures should this be necessary.
- Keeping a register of complaints and recording and dealing with any community issues or comments.
- Giving a report back on any environmental issues at site meetings.
- Reporting any incidents that may or have caused damage to the environment or breaches of the EMP to DEA.
- Prepare an environmental audit report at the conclusion of the construction phase.

The ECO shall communicate directly with the RE. Should problems arise on site that cannot be resolved between the ECO and the RE, the ECO shall take the matter up with the Engineer and/or the Proponent. If the Proponent does not respond the ECO shall take the matter up with DEA.

2.1.7 ENVIRONMENTAL OFFICER

The Contractor shall appoint, at his / her own cost, an Environmental Officer (EO) or Site Agent to ensure that the Construction EMP is implemented and ensure that all environmental specifications and Construction EMP requirements are met at all times. For the purposes of this document the term "EO" will be used interchangeably with Site Agent.

The EO shall be responsible for monitoring, reviewing and verifying the Contractor's compliance with the Construction EMP. The EO's duties in this regard shall include, *inter alia*, the following:

- Monitoring and verifying that the Construction EMP and Method Statements are adhered to at all times and taking action if specifications are not followed.
- Monitoring and verifying that environmental impacts are kept to a minimum.
- Assisting the RE and ECO in finding environmentally responsible solutions to problems.
- Inspecting the site on a regular basis with regard to compliance with the Construction EMP.
- Keeping accurate and detailed records of these inspections.
- Reporting any incidents of non-compliance with the Construction EMP to the RE and / or the ECO.
- Keeping a register of complaints on site and recording community comments and issues, and the actions taken in response to these complaints.

2.1.8 ENVIRONMENTAL MONITORING COMMITTEE

The Environmental Monitoring Committee (EMC) shall be a multidisciplinary team tasked with monitoring the implementation of the Construction EMP and resolving any environmental problems that may arise during the construction of the hotel and bulk services. The EMC shall be accountable for ensuring that environmentally sound principles guide the project during the construction phase.

The EMC shall consist of all the relevant stakeholders involved in the construction phase, as well as representatives of interested and affected parties. The following should be invited to form part of the EMC:

- Representatives from relevant government bodies, including DEA, Department of Water Affairs, Emthanjeni Local Municipality (ELM), etc.;
- Local councillors, ratepayers associations, residents associations, etc.;
- Surrounding landowners / farmers;
- Contractor and EO;
- Engineer;
- RE; and
- ECO.

If particular specialists (e.g. a vegetation specialist or freshwater ecologist) are required to advise the EMC on particular issues, these shall be brought in on a needs basis.

The EMC shall normally meet monthly during the construction phase. If the EMC is required to meet more or less frequently, this shall occur on a needs basis. The EMC will be co-ordinated by the ECO.

2.3 CONSTRUCTION EMP ADMINISTRATION

Copies of the Construction EMP shall be made available to DEA, Contractor, EO, Engineer, RE, ECO and all other members of the EMC.

Copies of the Construction EMP shall be kept at the site office/s during the construction phase and shall be distributed to the EO and all other senior contract personnel. All senior personnel shall be required to familiarise themselves with the contents of this document.

Any significant revisions to the Construction EMP document must be approved by DEA before the Construction EMP is revised. Records will be kept in the document indicating changes that have been made. The ECO shall be responsible for the implementation and distribution of any “approved” revisions to the EMP.

The Engineer may order the Contractor to suspend part or all of the works during the construction phase if the Contractor fails to comply with the specifications set out in the Construction EMP and Method Statements supplied by the Contractor and any Sub-contractors. Such suspension shall be enforced until compliance is achieved.

2.4 INFORMATION BOARD

The Contractor will be responsible for erecting information boards on site. The number and locations of these boards shall be agreed upon between the RE and ECO.

The contents of the information board shall be provided by the Engineer in consultation with the ECO, and will essentially be to advise the public of the construction operation and the prohibition on entering certain areas. The information board shall also provide the name and contact number of the ECO, to ensure that the public has access to the ECO to ask for information and/or to lodge any complaints.

2.5 METHOD STATEMENTS

The Contractor shall submit written Method Statements to the RE and ECO for all environmentally sensitive aspects of the work. A Method Statement Control Sheet, signed by the Contractor, must accompany each Method Statement (a pro forma Control Sheet is provided in Appendix A). Method Statements shall cover applicable details with regard to:

- Construction procedures;
- Materials and equipment to be used;
- Getting equipment to and from site;
- How the equipment/material will be moved while on site;
- How and where material will be stored;
- The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- Timing and location of activities;
- Compliance/non-compliance with the Specifications; and
- Any other information deemed necessary by the Engineer, RE or ECO.

Method Statements shall be submitted to the RE and ECO **at least three (3) days prior** to the commencement of operations. It should be noted that Method Statements must contain sufficient information and detail to enable the RE and ECO to apply their minds to the potential impacts of the works on the environment. The Contractor will also need to thoroughly understand what is required of him / her in order to undertake the works.

Work shall not commence until Method Statements have been approved by the RE. Failure to submit Method Statements may cause the RE to order the Contractor to suspend part or all of the works concerned until a Method Statement has been submitted and approved. Failure to submit Method Statements at least three days prior to commencing the relevant activity may result in a fine (see Section 2.10). Any damage caused to the surrounding environment by work done without prior approval shall be rehabilitated at the Contractor's cost.

As a minimum the following Method Statements are required:

- MS1:** Construction camp location and layout (Section 4.1.1);
- MS2:** Vegetation clearing (Section 4.3.1);
- MS3:** Hazardous substances (Section 4.4.2);
- MS4:** Solid waste management (Section 4.7.2);
- MS5:** Wastewater (Section 4.7.3);
- MS6:** Erosion and sediment control (Section 4.8);
- MS7:** Fire Control (Section 4.9);
- MS8:** Dust control (Section 4.12);
- MS9:** Temporary services (Section 4.14); and
- MS10:** Cement and concrete batching (Section 4.17).

The RE and / or the ECO shall specify any additional Method Statements that may be required. Where relevant the Method Statements indicated above can be combined on agreement with the RE or ECO.

2.6 ENVIRONMENTAL AWARENESS TRAINING

Before the commencement of any work on site, the Contractor's site management staff shall attend an environmental awareness-training course, of one-hour duration, presented by the ECO and RE. The Contractor shall liaise with the ECO prior to the commencement date of construction to fix a date and venue for the course.

The information presented at the course shall be communicated by the Contractor to the rest of his employees on the site, to any new employees coming onto site after the initial training course and to his / her suppliers. The presentation shall be conducted, as far as is possible, in the employees' language of choice. As a minimum, training shall include:

- Explanation of the importance of complying with the Construction EMP;
- Discussion of the potential environmental impacts of construction activities;
- Explanation of the management structure of individuals responsible for matters pertaining to the Construction EMP.
- Employees' roles and responsibilities, including emergency preparedness;
- Explanation of the mitigation measures that must be implemented when carrying out their activities;
- Explanation of the specifics of the Construction EMP and its specification; and
- Explanation of the Environmental Do's and Don'ts (see Appendix B).

The Contractor shall keep records of all environmental training sessions, including names of attendees, dates of their attendance and the information presented to them. Records of environmental training sessions shall be submitted to the ECO.

Before the commencement of any work on site, the Contractor's site management staff, RE and ECO shall attend an archaeological workshop presented by an appointed archaeologist (see Section 4.11).

2.7 MEETINGS

The ECO shall meet with the RE and EO on a monthly basis, or more frequently as required during the initial stages of the project. The ECO shall attend scheduled construction site meetings on a monthly basis throughout the contract period.

The EMC shall normally meet monthly during the construction phase. If the EMC is required to meet more or less frequently, this shall occur on a needs basis.

2.8 INSPECTION PROCEDURES

The day-to-day monitoring and verification that the Construction EMP is being adhered to shall be undertaken by the RE and the EO.

The ECO shall visit and inspect the site monthly to ensure that correct operational procedures are being implemented and that the Contractor is complying with the environmental specifications in the Construction EMP. Additional site inspections by the ECO may be needed during the initial and final stages of the project. The ECO shall address any queries to the RE. If the queries cannot be resolved at this level, they shall be referred to the Engineer and, if necessary, to DEA.

2.9 RECORD OF ACTIVITIES

The RE, ECO and EO shall keep a record of activities on site, including but not limited to meetings attended, Method Statements received and approved, issues arising on site, cases of non-compliance with the Construction EMP, penalties/fines issued and corrective action taken to solve problems that arise. In addition, the Contractor shall keep a record of complaints from interested and affected parties.

The RE shall undertake photographic monitoring of the contract. This shall include a photographic record of all areas that will be impacted by the construction activities prior to construction activities commencing. The ECO shall monitor all sensitive work environments, which may also include photographic monitoring.

2.10 FINES

A system of fines shall be implemented to ensure compliance with the Construction EMP (see Appendix C). Where the Contractor inflicts non-repairable damage upon the environment or fails to comply with any of the environmental specifications, he / she shall be liable to pay a fine. Non-compliance with the specifications of the Construction EMP constitutes a breach of Contract for which the Contractor may be liable to pay a fine. The Contractor is deemed not to have complied with the Construction EMP if:

- There is evidence of contravention of the Construction EMP specifications, including any non-compliance with an approved Method Statement;
- Construction activities take place outside the defined boundaries of the site;
- Environmental damage ensues due to negligence;
- The Contractor fails to comply with corrective or other instructions issued by the RE within a specific time period; and/or
- The Contractor fails to respond adequately to complaints from the public.

If excessive infringement with regard to any of the above (as determined by the Engineer) is registered, then the Proponent reserves the right to terminate the Contractor's contract.

The system of fines shall be implemented in the following way:

- Fines shall be issued per incident at the discretion of the Engineer;
- Fines shall be issued in addition to any remedial costs incurred as a result of non-compliance with the environmental specifications;
- The Engineer shall inform the Contractor of the contravention and the amount of the fine, and will deduct the total amount from the Contractor at the end of the contract; and
- Fines, including but not limited to those activities presented in Appendix C, shall be imposed by the Engineer on the Contractor, his staff and/or the Sub-contractors' staff for contravention of the environmental specifications. Where there are ranges, the amount shall depend on the severity and extent of the damage done to the environment.

Failure by any employee of the Contractor or their Sub-contractors to show adequate consideration to the environmental aspects of the contract shall be considered sufficient cause for the EO and/or ECO to recommend to the Engineer / RE to have that employee removed from the site. The EO and/or ECO may, through the Engineer / RE, also order the removal of equipment that is causing continual environmental damage.

2.11 INTERNAL REVIEW AND AUDITING

The Contractor and EO shall establish an internal review procedure to monitor the progress and implementation of the Construction EMP.

Where necessary, and upon the recommendation of the RE and / or the ECO, procedures that require modification shall be changed to improve the efficiency of the Construction EMP. All significant modifications to the Construction EMP shall be approved by DEA before these changes or adjustments to the Construction EMP are implemented. Any changes or adjustments to the Construction EMP shall be registered in the daily records of the RE. Adjustment and update of the original Construction EMP document is not required when these *ad hoc* changes are made.

At the conclusion of the project an environmental audit report shall be compiled and submitted to DEA. This report shall be compiled by the ECO, in collaboration with the RE, EO and the Contractor. It shall, as a minimum, outline the implementation of the Construction EMP, and highlight any problems and issues that arose during the construction period to report, on a formal basis, the lessons learned from this project.

2.12 LICENCES AND PERMITS

2.12.1 WATER USE LICENCES

The Contractor shall ensure a Water Use Licence has been issued by the Department of Water Affairs (Northern Cape Regional Office) for the abstraction and use of groundwater during construction.

In addition, the Contractor shall ensure that a Water Use Licence has been issued, if not Generally Authorised, for the altering of the bed and banks of watercourses on site due to the construction of the access roads. The need for a Water Use Licence shall be confirmed by the Proponent by submitting a Water Use Licence application to DWA (Northern Cape Regional Office).

2.12.2 ARCHAEOLOGICAL SAMPLING PERMIT

A local archaeologist is to be appointed to sample and collect any scattered stone tools found on site before construction commences (see Section 4.11). A sampling permit is to be obtained from the South African Heritage Resources Agency (SAHRA) before sampling can be undertaken (Tel: 021 462 4502).

2.12.3 ABNORMAL LOAD PERMIT

A permit shall be obtained from the relevant Provincial Authority for any abnormal loads (e.g. inverter buildings and transformers).

3. EMPLOYMENT

The Contractor should, where reasonable and practical, implement a 'locals first' employment policy¹, especially for semi- and low-skilled job categories. In addition, local Contractors/Sub-contractors with BEE criteria should be considered. In order to facilitate this 'locals first' employment policy the following is recommended:

- The ELM should be contacted to establish the existence of a skills database for the area;
- The Contractor should consider the establishment of an employment office in De Aar, if one does not exist already; and
- Interested and Affected Parties on the EIA project database should be informed of potential job opportunities for locals and the intended employment procedures.

All employment seekers must be informed that the nature of the work is temporary. The recruitment process should seek to promote gender equality and the employment of women wherever possible.

A policy that no employment opportunities would be offered at the gate must be implemented.

A Code of Conduct should be developed in consultation with the EMC. The code should identify what types of behaviour and activities by construction workers are not permitted. All dismissals must comply with the South African labour legislation. All workers are to be informed at the outset of the construction phase of the conditions contained on the Code of Conduct.

4. ENVIRONMENTAL SPECIFICATIONS

4.1 CONSTRUCTION CAMP

4.1.1 LOCATION OF CONSTRUCTION CAMP

"Construction Camp" refers to all storage stockpiles sites, site offices, container sites, other areas required to undertake construction and rest areas for employees. The construction camp shall be located at an easily accessible point and within an area of low environmental sensitivity. The following recommendations relating to the location and establishment of the construction camp are included in the EIR:

- The extent of the construction camp and stores should be limited in area to only that which is essential;
- The construction camp, material stockpiles and lay-down area/s should be preferably located in the vicinity of the proposed maintenance buildings or existing shooting range in order to minimise disturbance; and
- The construction camp, material stockpiles and lay-down area/s should be screened from the farmstead.

¹ Note that while preference to local employees and companies is recommended, it is recognised that a competitive tender process may not guarantee the employment of local labour for the construction phase.

The Contractor, RE and ECO shall agree on mutually acceptable locations for the establishment of the camp. The RE and ECO shall approve the final location of the camp prior to its establishment.

The construction camp shall be demarcated by a fence, the position of which will be agreed by the RE and Contractor. Suitable signs must be erected to clearly demarcate these areas.

The Contractor shall submit a Method Statement indicating the layout and preparation of the construction camp(s).

MS1: The Contractor shall submit a Method Statement indicating the location, preparation and layout of the construction camp.

4.1.2 TOILET FACILITIES

The Contractor shall provide suitable sanitary arrangements (e.g. chemical toilets) as per building guidelines (SABS 0400). There should be one toilet for every 15 workers on site. Toilets must be easily accessible and shall be secured in order to prevent them from blowing over.

Toilet/s shall be located within the construction camp and in construction areas where there will be a concentration of labour. The siting of toilets shall be done in consultation with the RE or ECO to ensure that they are easily accessible for employees and shall not be more than 50 m away from where construction activities are being undertaken. Toilets shall also be located at least 30 m from any of the drainage channels on site.

The Contractor shall be responsible for ensuring that all ablution facilities are maintained in a clean and sanitary condition to the satisfaction of the RE or ECO. The Contractor shall provide toilet paper. The Contractor shall appoint a suitable Sub-contractor to empty toilets on a regular basis. The Sub-contractor shall ensure that there is no spillage when the chemical toilets are cleaned and that the contents are properly removed from site.

The Contractor shall be responsible for enforcing the use of these facilities. Performing ablutions outside of established toilet facilities is strictly prohibited (refer to List of Fines, Appendix C).

4.1.3 EATING AREAS

The Contractor shall establish eating areas, as agreed with the RE. These areas shall provide adequate temporary shade to ensure that employees do not move off site to eat.

The Contractor shall provide adequate refuse bins at all eating areas to the satisfaction of the RE and shall ensure that all eating areas are cleaned up on a daily basis. Collected waste shall be stored in a central waste area within the construction camp that has been approved by the RE and ECO.

Any cooking of food on site shall be done using gas cookers. Surface water in drainage courses shall not be used for washing of pots and plates.

4.1.4 WATER PROVISION

The Contractor shall be responsible for ensuring that there is access to clean drinking water for all employees on site. If water is stored on site, drinking water and multi-purposed water storage facilities shall be clearly distinguished and demarcated.

4.1.5 GENERAL AESTHETICS AND LIGHTING

All construction areas shall be kept neat and tidy at all times. Different materials and equipment shall be kept in designated areas and storing/stockpiling shall be kept orderly.

The Contractor shall take reasonable measures (e.g. visual screening using shade cloth in combination with fencing to screen the construction site, equipment and materials) to ensure that construction camp does not have an unreasonable impact on the aesthetics of the area. Temporary construction buildings and structures shall be shielded from the farmstead by dark coloured shade cloth netting or painted dark colours in order to blend into the environment.

The Contractor shall ensure that any lighting installed at the construction camp does not interfere with road traffic or cause a reasonably avoidable disturbance to the farmstead. Where possible, lights should be directed downwards to avoid illuminating the sky and minimising light spill.

4.1.6 ACCOMMODATION

No construction workers, with the exception of security personnel, shall be permitted to stay overnight on the site.

4.2 SITE DEMARCATION

The 'site' refers to the total area where the contract will take place awarded to the Contractor and any other area reasonably required by the Contractor to undertake the construction activities in order to fulfil the contract.

Areas where construction activities are prohibited are referred to as No-Go areas and shall be demarcated to ensure that environmentally sensitive areas are not impacted by the construction activities. 'No-go' areas shall be demarcated by fencing of at least three strands of wire, the position of which will be agreed by the RE and ECO, and appropriate signage. No-Go areas include:

1. The sensitive rocky outcrop areas; and
2. The freshwater buffers indicated in Figure 1.1, except where access roads pass through the drainage channels. Where access routes need to be constructed through the drainage channels, disturbance must be limited. In this regard, the work area within the drainage channels shall be demarcated, in consultation with the RE and / or ECO, in order to ensure disturbance is minimised.

Entry into these areas without the ECO's permission could result in a penalty (Appendix C). The Contractor shall be responsible for any clean-up and / or rehabilitation of all areas impacted outside the site.

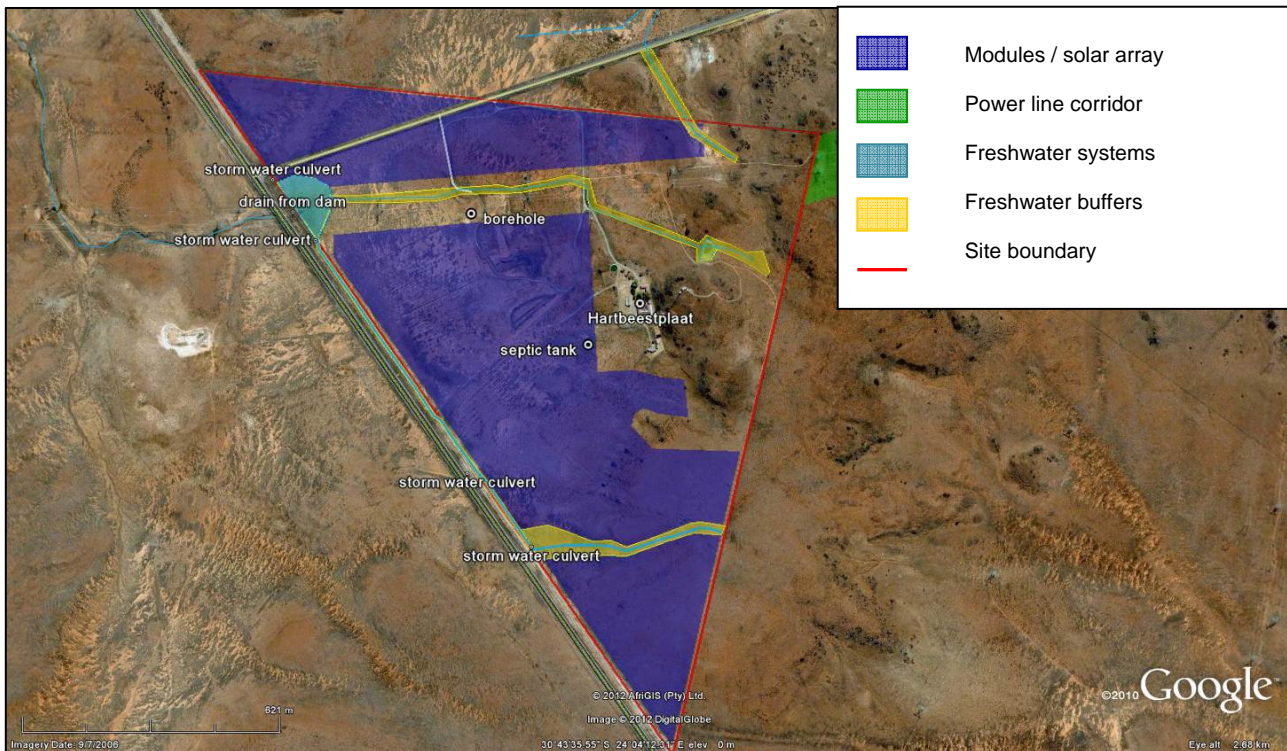


Figure 1.1: Freshwater buffers.

4.3 SITE CLEARING

4.3.1 VEGETATION CLEARING

Before clearing of vegetation, the Contractor shall ensure that all litter and non-organic material is removed from the area to be cleared.

Vegetation clearing shall take place in a phased manner in order to retain vegetation cover for as long as possible. There is no requirement for a 'search and rescue' operation to be undertaken since no sensitive plant species occur within the proposed footprint. All invasive alien vegetation currently within the drainage channels is to be removed (see Figure 1.1). The use of herbicides is prohibited unless approved by the RE.

All indigenous plant material removed from cleared areas shall be stockpiled for mulching or temporarily stockpiled in a demarcated area, which meets the satisfaction of the RE, before disposal at an approved landfill site or for use during rehabilitation. All alien vegetation cleared shall be removed from site and disposed of at an approved landfill site. No burying of cut alien vegetation may take place on site.

MS2: The Contractor shall submit a site clearing Method Statement to the RE and ECO. This method statement shall clearly detail the clearing and how this will be done, where and how cleared material will be stored or disposed of, etc.

4.3.2 TOPSOIL

Topsoil (an approximately 150 mm layer) shall be removed from areas to be disturbed during construction and stockpiled for landscaping / rehabilitation purposes. Topsoil stockpiles shall be convex and no more than 2 m high. Stockpiles shall be located in areas agreed to by the RE and ECO.

Topsoil stockpiles shall not be subject to compaction greater than 1500 kg/m² and shall not be pushed by a bulldozer for more than 50 m.

Topsoil stockpiles shall be monitored regularly to identify any alien plants, which shall be removed when they germinate to prevent contamination of the seed bank.

Appropriate measures, as agreed with the RE or ECO, shall be taken to protect topsoil stockpiles from erosion by wind or water by providing suitable stormwater and cut off drains, containment using hessian or similar material and/or by establishing suitable temporary vegetation. Stockpiles shall not be covered with materials such as plastic that may cause it to compost or would kill the seed bank.

It is important that topsoil does not remain stockpiled for too long as soil chemistry and natural processes decline after time and seed viability may be compromised. Stockpiles shall not be left compacted for more than eight months before being used for rehabilitation resulting in poor rehabilitation success.

The Contractor shall be held responsible for the replacement, at his / her own cost, for any unnecessary loss of topsoil due to his failure to work according to the requirements of this EMP.

4.4 MATERIALS HANDLING AND STORAGE

4.4.1 HANDLING

The Contractor shall ensure that all suppliers and their delivery drivers are aware of procedures and restrictions in terms of this EMP.

A permit shall be obtained from the relevant Provincial Authority for a vehicle carrying an abnormal load (e.g. inverter buildings and transformers).

The Contractor (and suppliers) shall ensure that all materials are appropriately secured to ensure safe passage between destinations. Loads including, but not limited to sand, stone chip, refuse, paper, fine vegetation, and cement, shall have appropriate tarpaulins or covers to prevent them spilling from the vehicle during transit. The Contractor shall be responsible for any clean-up resulting from the failure by his employees or suppliers to properly secure transported materials. The Contractor shall ensure that delivery drivers are supervised during offloading.

4.4.2 STORAGE OF CONSTRUCTION MATERIALS AND HAZARDOUS SUBSTANCES

All fuel, oil and other hazardous substances (i.e., fuel, poisons, etc.) shall be confined to demarcated, adequately bunded areas within the construction camp and stored in suitable containers. If more than 80 m³ is to be stored on site, environmental authorisation is required from DEA.

Hazard signs indicating the nature of the stored materials shall be displayed on the storage facility or containment structure. Fuel shall be stored in steel tank/s supplied and maintained by the fuel suppliers. Tank/s shall be adequately bunded (110% of volume). The floor and wall of the bund area shall be impervious to prevent infiltration of any spilled / leaked fuel, oil or hazardous substance into the soil. Suitable fire fighting equipment, to the approval of the RE, shall be supplied and installed by the Contractor in the hazardous substances storage area.

The relevant Material Safety Data Sheets for all hazardous chemical substances (as defined in the Regulations for Hazardous Chemical Substances) shall be submitted to the RE. The Contractor shall have a copy of the Material Safety Data Sheets readily available and ensure that he / she or his / her employees who are required to use such substances are fully conversant with the safe handling precautions, protective equipment to be used and storage precautions to be taken.

The Contractor shall obtain a permit, if required, to store fuels and hazardous materials on site in terms of the local by-law. The Contractor shall append a copy of the permit, if required, to the required Method Statement (see below).

Areas for the temporary stockpiling of excavated material and other construction material shall be as agreed with the RE and ECO. No building material shall be stored outside the site

The Contractor shall ensure that run-off from any stockpile, fuel / oil or hazardous substance storage area is contained and does not pollute any water resources.

MS3: The Contractor shall submit a Method Statement detailing the location of storage, methods intended for storage of oil, fuel and other hazardous substances. This Method Statement should also detail precautions that shall be implemented to prevent and mitigate any spills and leakage of these substances.

4.4.3 STORAGE OF EQUIPMENT

All plant, construction equipment, vehicles or other items shall be stored within the construction camp, unless prior arrangements have been made with the RE or ECO.

Drip trays shall be provided for stationary plant (such as compressors, pumps, generators, etc.) and for "parked" plant (e.g. mechanised equipment).

4.5 REFUELLING AND MAINTENANCE

4.5.1 REFUELLING

Where reasonably practical, vehicles shall only be refuelled in a demarcated refuelling/servicing area (as agreed to with the RE and ECO). No re-fuelling shall be within 30 m of any local drainage channel.

The surface under the refuelling/servicing area shall be protected against pollution (e.g. the use of drip trays) to the reasonable satisfaction of the RE and ECO prior to any refuelling activities.

4.5.2 MAINTENANCE

All vehicles and equipment shall be kept in good working order and serviced regularly. Leaking equipment shall be repaired immediately or removed from the site.

Where reasonably practical, maintenance activities shall only be undertaken in a demarcated maintenance area (as agreed to with the RE and ECO). No maintenance activities shall be allowed within 30 m of any local drainage channel, unless this is absolutely necessary.

When servicing equipment, drip trays shall be used to collect the waste oil and other lubricants. All hazardous waste from maintenance activities shall be disposed of as specified in Section 4.7.1.

The washing of equipment shall be restricted to urgent maintenance requirements only. All washing shall be undertaken in the maintenance area, and these areas must be equipped with suitable wastewater collection measures (see Section 4.7.3). The use of detergents for washing shall be restricted to low phosphate and nitrate containing, low sudsing-type detergents.

4.6 ACCIDENTAL LEAKS AND SPILLS

The Contractor shall ensure that his / her employees are aware of the procedure to be followed for dealing with spills and leaks. Any accidental leak and spill of fuel, oil or other hazardous substances is to be reported to the RE or ECO immediately so that the best remediation method can be quickly implemented. In the event of a large spill, the RE or ECO shall inform the local Pollution Control Department and Fire Brigade immediately.

In the event of a hydrocarbon spill, the source of the spillage shall be isolated and the spillage contained. The area shall be cordoned off and secured. The Contractor shall ensure that there is always a supply of absorbent material readily available to absorb / breakdown spills. The quantity of such materials shall be able to handle the total volume of the hydrocarbon / hazardous substance stored on site. This material must be accepted by the RE prior to any refuelling activities. Hydrocarbon contaminated material and / or soil shall be collected and stored in a bunded area until future disposal (see Section 4.7.1).

The relevant Material Safety Data Sheets for all hazardous chemical substances (as defined in the Regulations for Hazardous Chemical Substances) shall be on site. Procedures detailed in the Material Safety Data Sheets shall be followed in the event of a spill or emergency situation.

The Contractor shall be liable to arrange for professional service providers to clear the area affected by the spill, if required.

The Contractor shall submit a Method Statement detailing the precautions that shall be implemented to limit spills and leakage of these hydrocarbons and other hazardous substances (see Section 4.4.2).

4.7 WASTE MANAGEMENT

4.7.1 HYDROCARBON AND HAZARDOUS WASTE

All hydrocarbon (e.g. fuel, oils and contaminated soil / materials) and other hazardous waste (e.g. herbicides, pesticides, bitumen, tar, etc.) resulting from spills, refuelling and maintenance activities shall be disposed of in a licensed hazardous waste site or, where possible, sold to an approved used-oil recycling company. The Contractor shall provide disposal certificates to the RE.

Used oil, lubricants, cleaning materials, etc. from the maintenance of vehicles and machinery may be collected in holding tanks / contamination drums prior to disposal.

No hydrocarbon and hazardous waste shall be burnt or buried on site. Under no circumstances shall the spoiling or burial of tar or bituminous products be allowed on site. Unused or rejected tar or bituminous products shall be returned to the supplier's production plant.

4.7.2 SOLID WASTE

Solid waste includes all construction waste (rubble, cement bags, old cement, tags, wrapping materials, timber, cans, wire, nails, etc.) and surplus food, food packaging, organic waste, etc.

The Contractor shall be responsible for the establishment of a solid waste control and removal system that is acceptable to the RE and ECO in order to prevent the spread of waste in, and beyond, the construction area. An integrated waste management approach shall be used, based on the principles of waste minimisation, reduction, reuse and recycling of materials. Containers for glass, paper, metals and plastics shall be provided. The Contractor shall remove all construction waste from site at his / her own expense.

The Contractor shall provide bins (with lids) of sufficient number and capacity to store solid waste produced on a daily basis. The lids shall be kept firmly on the bins at all times. Bins shall to be located within the construction camp, eating areas and construction areas where there will be a concentration of labour. Bins shall be emptied on a weekly basis or more frequently as required. The general cleanliness of the site shall form part of the EO's, RE's and ECO's inspections.

All solid waste may be temporarily stored on site in a demarcated area, which meets the satisfaction of the RE. No waste shall be stored outside the site. All solid waste shall be disposed of offsite at a licensed landfill site. The stockpiling of construction rubble or other material shall only be permitted in areas approved by the RE. No waste material or litter shall be burnt or buried on site.

MS4: The Contractor shall submit a Method Statement detailing a solid waste control system (storage, provision of bins, site clean-up schedule, bin clean-out schedule, etc.) to the RE and ECO.

4.7.3 WASTEWATER

The Contractor(s) shall prevent pollution of surface or groundwater from the release, accidental or otherwise of contaminated water (including contamination with chemicals, oils, fuels, cement, sewage, construction water, water carrying products, etc.) as a result of construction activities.

The Contractor shall be responsible for the construction and operation of necessary collection facilities (e.g. conservancy tanks, settlement ponds, etc.) in order to prevent such pollution and / or settlement of suspended matter, and shall dispose of the collected waste as approved by the RE. Water from any kitchen, showers, laboratories, sinks, etc. shall be discharged into a conservancy tank for removal from the site.

The Contractor shall ensure that water runoff from fuel depots, workshops, truck washing areas and concrete swills passes through a oil separation / settlement system before being released or alternatively is directed into a conservancy tank for disposal at a site approved by the ECO and local authority.

Temporary stormwater drainage from the works shall be designed in collaboration with the RE and ECO. No wastewater shall be disposed of directly or indirectly into any surface water bodies.

MS5: The Contractor shall submit a Method Statement detailing how wastewater is to be collected from all wastewater generating areas (e.g. maintenance areas, batching plants, bunds, etc.), as well as storage and disposal methods. The Method Statement shall also detail the temporary stormwater drainage on site. If the Contractor intends to carry out any on-site wastewater treatment, this shall also be included.

4.8 EROSION AND SEDIMENTATION CONTROL

The Contractor shall, as an ongoing exercise, provide sedimentation and erosion control to the satisfaction of the RE. During construction the Contractor shall protect areas susceptible to erosion by installing necessary temporary and permanent drainage works as soon as possible and by taking measures necessary to prevent surface water from being concentrated in streams and from scouring slopes, banks or other areas.

Any runnels or erosion channels developed during the construction period shall be backfilled and compacted, and the areas restored to an acceptable condition (as determined by the RE). Stabilisation of cleared areas to prevent and control erosion and/or sedimentation shall be actively managed. The method of stabilisation shall be determined in consultation with the RE and ECO. Consideration and provision shall be made for the following methods (or combination thereof):

- Brushcut packing (although no alien plant material may be used for this purpose);
- Mulch or chip cover (although no alien plant material may be used for this purpose);
- Straw stabilising (at a rate of one bale/m² rotated into the top 100 mm of the completed earthworks – only straw bales held with string (not wire) may be used);
- Watering;
- Planting/sodding;
- Hand seeding/sowing;
- Application of soil binders and anti-erosion compounds; and/or
- Mechanical cover/packing structures (including the use of Geofabric, hessian cover, log/pole fencing).

The EO shall demarcated stabilised areas with painted stakes or hazard tape. Traffic and movement over stabilised areas shall be restricted and controlled by the EO, and damage to stabilised areas shall be repaired and maintained by the Contractor to the satisfaction of the RE and ECO.

During construction the Contractor shall implement measures to prevent the migration of material (fines) from the works into drainage lines. This may include the use of a sand bag retention walls, cut-off trench, straw bales or geofabric siltation barriers constructed across the site at specific points.

MS6: A Method Statement shall be developed and submitted to the RE and ECO to deal with erosion and sedimentation issues.

4.9 FIRE CONTROL

No open fires shall be allowed on site for the purpose of cooking or warmth. *Bona fide* braai fires (such braai fires shall be limited to the traditional “month end” braais and not individual daily cooking fires) may be lit within the construction camp. Smoking is not allowed on site, other than at designated smoking points.

The Contractor shall take all reasonable steps to prevent the accidental occurrence or spread of fire. The Contractor shall appoint a fire officer who shall be responsible for ensuring immediate and appropriate action in the event of a fire. The Contractor shall ensure that all site personnel are aware of the procedure to be followed in the event of a fire. The appointed fire officer shall notify the local Fire and Emergency Services in the event of a fire and shall not delay doing so until such time as the fire is beyond his / her control.

The Contractor shall ensure that there is basic fire-fighting equipment on site at all times. This equipment shall include fire extinguishers and beaters. The Contractor shall pay the costs incurred by organisations called to put out fires started by himself/herself, his/her staff or any sub-contractor. The Contractor shall also pay the costs incurred to reinstate burnt areas as deemed necessary the RE.

Any work that requires the use of fire or poses a fire risk (e.g. welding) may only take place at that designated area and as approved by the RE. Fire-fighting equipment shall be available in these areas. The risk of fires should be reduced as much as possible (e.g. clearing working areas and avoiding working in high wind conditions).

The Contractor shall ensure that the telephone number of the local Fire and Emergency Services are displayed at the site offices.

The Contractor shall ensure compliance with the requirements of the Veld & Forest Fires Act, 1998 (No. 101 of 1998) in terms of establishing a Fire Protection Association with the landowners.

MS7: The Contractor is to ascertain the fire requirements of local Fire and Emergency Services and shall submit a fire contingency plan Method Statement to the RE and ECO.

4.10 PROTECTION OF NATURAL FEATURES, FLORA AND FAUNA

4.10.1 PROTECTION OF NATURAL FEATURES

The Contractor shall not permit his employees to make use of any natural water sources (e.g. streams, dams, etc.) situated on site for the purposes of swimming, personal washing and the washing of machinery or clothes.

The Contractor shall not deface, paint, damage or mark any natural features outside the site unless agreed beforehand with the RE. Any features affected by the Contractor in contravention of this clause shall be restored / rehabilitated to the satisfaction of the RE and ECO.

4.10.2 PROTECTION OF FLORA AND FAUNA

The removal, damage or disturbance of flora, fauna or avifauna is forbidden outside the site without the written approval of the RE. No-Go areas are listed in Section 4.2. The clearing of vegetation within construction areas shall be undertaken as specified in Section 4.3.

No threatened or protected plant species were found on site. Therefore, no permit is required in terms of National Environmental Management Act: Biodiversity Act, 2004 to remove or destroy threatened or protected species.

Although no formal faunal search and rescue is considered necessary, every effort is to be made to relocate faunal species that cannot flee on their own accord to a suitable area immediately adjacent to the proposed footprint.

The Contractor shall ensure that no hunting, trapping, shooting, poisoning or otherwise disturbance of any fauna takes place. The feeding of any wild animals is prohibited. No domestic pets or livestock are permitted on site.

4.11 PROTECTION OF HERITAGE RESOURCES

The following heritage management plan shall be implemented:

- A local archaeologist is to be appointed to sample and collect any scattered stone tools found on site before construction commences. It is recommended that the McGregor Museum in Kimberley (Tel: 053 839 2700) be contacted to provide support in this regard;
- A sampling permit is to be obtained from SAHRA (see Section 2.12.2). The appointed archaeologist will be required to abide by the specifications as set out by SAHRA;
- The appointed archaeologist is to provide a one day workshop for the Contractor, EO, RE and ECO to explain the type of heritage objects that may be uncovered and the methodology to follow in event any objects are uncovered during construction; and
- If any additional archaeological sites / heritage resources are discovered during construction the Contractor shall abide by the methodology and specifications as set out by the archaeologist.

4.12 DUST CONTROL

The Contractor shall ensure that the generation of dust is minimised and shall implement a dust control programme to maintain a safe working environment, minimise nuisance for the landowner and reduce possible interference with road traffic.

Vegetation clearing shall take place in a phased manner in order to retain vegetation cover for as long as possible. The Contractor shall ensure that exposed soil and material stockpiles are adequately protected against the wind (e.g. water spray vehicles, covering of material stockpiles, etc.). The location of stockpiles shall take into consideration the prevailing wind directions and locations of sensitive receptors.

Construction vehicles shall comply with speed limits (speed limit for light vehicles is 40 km/hr and for heavy vehicles 20 km/hr) and haul distances shall be minimised. Material loads shall be suitably covered and secured during transportation.

MS8: The Contractor shall submit a Method Statement detailing the control of dust on site.

4.13 NOISE CONTROL AND WORKING HOURS

The Contractor shall be familiar with and adhere to, any local by-laws and regulations regarding the generation of noise and hours of operation.

The Contractor shall avoid construction activities outside of "normal working hours". If necessary, this should be determined together with the local authority and landowner. The Contractor shall negotiate for any permits requiring deviation from local by-laws and/or regulations with the local authority. However, the Contractor shall advise the RE and ECO in writing of such intention prior to negotiating for these permits.

The Contractor shall be held responsible for any complaints received from the authority and/or public with respect to any contravention of the agreed conditions.

4.14 TEMPORARY SERVICES

The Contractor shall advise the RE and ECO of all temporary services required on site.

MS9: A Method Statement dealing with temporary services shall be developed and submitted to the RE and ECO. The Method Statement shall detail where and how he / she proposes to lay such services.

4.15 WATER USAGE

The Contractor shall ensure a Water Use Licence has been issued by the DWA (Northern Cape Regional Office) for the abstraction and use of groundwater during construction (see Section 2.12.1).

Were feasible, multiple boreholes shall be used for shorter durations, as this would reduce the extent of the radius of influence.

4.16 CEMENT AND CONCRETE BATCHING

Any concrete batching activities shall be located in an area of low environmental sensitivity to be identified and approved by the RE.

Cement and concrete mixing directly on the ground shall not be allowed and shall take place on impermeable surfaces to the satisfaction of the RE.

Unused cement bags shall be stored out of the rain where runoff won't affect them. Used (empty) cement bags shall be collected and stored in weatherproof containers to prevent windblown cement dust and water contamination. Used cement bags shall not be used for any other purpose and shall be disposed of on a regular basis via the solid waste management system (see Section 4.7.2).

All excess concrete shall be removed from site on completion of concrete works and disposed of at a licensed landfill site. Washing of the excess concrete into the ground shall be prohibited.

MS10: The Contractor shall submit a Method Statement detailing cement storage, concrete batching areas and methods, method of transport of cement and concrete, storage and disposal of used cement bags, etc. for each concrete batching operation.

4.17 SAFETY AND SECURITY

The Contractor shall ensure that his / her staff do not access adjacent farms under any circumstances except on official business. The movement of construction workers on and off the site shall be closely managed and monitored by the Contractor.

Employees shall be transported to and from site on a daily basis. In addition, the Contractor shall make necessary arrangements to enable workers from outside the area to return home over weekends and or on a regular basis.

The contractor shall make the necessary arrangements for ensuring that all non-local construction workers are transported back to their place of residence once the construction phase is completed.

The Contractor shall implement an HIV/AIDS awareness programme for all construction workers at the outset of the construction phase.

All vehicles shall be road-worthy. Drivers shall be qualified and adhere to speed limits.

4.18 AESTHETICS AND LIGHTING

The Contractor shall take reasonable measures (e.g. visual screening using shade cloth in combination with fencing to screen equipment and materials) to ensure that construction activities do not have an unreasonable impact on the aesthetics of the area.

The Contractor shall ensure that any lighting installed on the site for his / her activities does not interfere with road traffic or cause a reasonably avoidable disturbance to the farmstead.

4.19 ACCESS ROADS AND TRAFFIC MANAGEMENT

A permit shall be obtained from the relevant Provincial Authority for any abnormal loads (Section 2.12.3).

The Contractor shall limit construction vehicles travelling on public roads to and from site during the morning and afternoon peak periods and on public holidays. In addition, roads through densely populated built-up areas shall be avoided where possible.

The Contractor shall also ensure that adequate traffic accommodation and safety measures (as appropriate) are put in place along the Hydra substation access road to ensure traffic flow and safety is not adversely affected.

Existing access roads on site should be used as far as possible. Only access routes/positions approved by the RE shall be used. These approved routes shall be staked out in order to avoid spill over into adjacent areas.

The Contractor shall ensure that a Water Use Licence has been issued, if not Generally Authorised, for the altering of the bed and banks of watercourses on site due to the construction of the access roads (see Section 2.12.1).

4.20 COMPENSATION

The Engineer shall develop a grievance procedure to ensure fair and prompt resolution of problems that may arise from the project.

The Contractor shall enter into an agreement with the landowner whereby damages to farm property, stock theft and disruptions to farming activities are compensated.

4.21 OPEN SPACE MANAGEMENT

Open space management is dealt with in Sections 4.2 (site demarcation) and 4.10 (protection of natural features, flora and fauna).

4.22 SITE REHABILITATION AND LANDSCAPING

On completion of the project, the Contractor shall ensure that all structures, equipment, materials, waste, rubble, notice boards and temporary fences used during the construction operation are removed with minimum damage to the surrounding area. The Contractor shall clean and clear the site to the satisfaction of the RE.

In the case of accidental spills of oil or chemicals in the construction camp, the affected soil shall be dug out and removed from site for disposal at a hazardous waste site and replaced with fresh topsoil.

The Contractor shall appoint a suitably experienced Rehabilitation / Landscaping Contractor to compile a vegetation rehabilitation plan. The Contractor shall submit the vegetation rehabilitation plan to the RE for approval. The vegetation rehabilitation plan shall include, but not limited to the following:

- Seed collection, harvesting methods and locations and seed storage methods;
- Seed mix;
- Topsoil, mulch, fertiliser and soil stabiliser requirements and application;
- Erosion control measures;
- Landscaping and revegetation methods (e.g. hydroseeding, planting, etc.) and timing;
- Vegetation establishment and maintenance requirements for all revegetated areas; and
- The use of any herbicides, pesticides and other poisonous substances, if required.

The landscaping contractor / horticulturist appointed to prepare the vegetation rehabilitation plan shall be familiar with the vegetation in the area and his/her appointment must be approved by the RE.

APPENDIX A:
METHOD STATEMENT CONTROL SHEET

DE AAR SOLAR ONE PHOTOVOLTAIC POWER PROJECT

Contract No. _____

METHOD STATEMENT CONTROL SHEET

[THIS CONTROL SHEET IS TO BE ATTACHED TO ALL METHOD STATEMENTS]

MS Number:

THIS SECTION TO BE COMPLETED BY CONTRACTOR/METHOD STATEMENT AUTHOR ONLY

TITLE:
DESCRIPTION:
SUBMITTED BY:

DATE REQUESTED BY RE: DATE SUBMITTED:

DATE RESPONSE REQUIRED BY: DATE WORK START:

REVIEW SCHEDULE		
DATE	AUTHORITY	COMMENTS

DISTRIBUTION AND AUTHORISATION			
	RE	ECO	CONTRACTOR
Name			
Signature			
Date			

CONTRACTOR NOTE: METHOD STATEMENTS SHOULD ADDRESS THE FOLLOWING:

- WHAT Brief description of the work to be undertaken
- HOW Detailed description of the process of work, methods and materials
- WHERE Description/sketch/map of locality of work (where applicable)
- WHEN Due commencement date and completion date estimate (day/night work)

APPENDIX B:
ENVIRONMENTAL DO'S AND DON'TS

DO'S AND DON'T'S



Workers & equipment must stay inside the site boundaries at all times



**Do not swim in or drink from streams
Do not throw oil, petrol, diesel, concrete or rubbish in the stream
Do not work in the stream without direct instruction
Do not damage the banks or vegetation of the stream**



**Protect animals on the site
Ask your supervisor or Contract's Manager to remove animals found on site**



**Do not damage or cut down any trees or plants without permission
Do not pick flowers**



**Put cigarette butts in a rubbish bin
Do not smoke near gas, paints or petrol
Do not light any fires without permission
Know the positions of fire fighting equipment
Report all fires
Do not burn rubbish/ vegetation without permission**



**Work with petrol, oil & diesel in marked areas
Report any petrol, oil & diesel leaks or spills
Use a drip tray under vehicles & machinery
Empty drip trays after rain & throw away where instructed**



Try to avoid producing dust - wet dry ground & soil



**Do not make loud noises around the site, especially near schools and homes
Report or repair noisy vehicles**



**Use the toilets provided
Report full or leaking toilets**



**Only eat in demarcated eating areas
Never eat near a river or stream
Put packaging & leftover food into rubbish bin**



**Do not litter - put all rubbish (especially cement bags) into the bins provided
Report full bins to your supervisor
The responsible person should empty bins regularly**



**Always keep to the speed limit
Drivers - check & report leaks
Ensure loads are secure & do not spill**



Know all the emergency phone numbers



**Spot fines of between R20 and R2000
Removal from site
Construction may be stopped**



**Report any breaks, floods, fires, leaks and injuries to your supervisor
Ask questions!**

MOETS EN MOENIES



Werkers en gereedskap moet ten alle tye binne die terreingrense bly.



Moenie van strome drink of daarin swem nie.
Moenie olie, petrol, diesel, sement of rommel in strome gooi nie.

Moenie in strome werk sonder direkte instruksie nie.

Moenie stroomoewers en plantegroei beskadig nie.



Beskerm diere op die konstruksieterrain.

Vra u toesighouer of Kontrakbestuurder om diere van die terrain te verwyder.



Moenie enige plante of bome beskadig of afny sonder toestemming nie.

Moenie blomme pluk nie.



Gooi sigaretstompies in 'n asblik.

Moenie rook naby gas, verf of petrol nie.

Moenie sonder toestemming enige vuur maak nie.

Waat waar brandbestrydingstoerusting gestoor word
Meld alle vuur onmiddellik aan.

Moenie rommel verbrand sonder toestemming nie.



Werk slegs in gemerkte areas met petrol, olie & diesel.

Meld alle petrol, olie en diesel lekkasies aan.

Gebruik 'n drupbak onder voertuie en masjinerie.

Maak drupbakke leeg na reën, maar nie in riviere nie



Probeer om nie stof te maak nie.

Maak droë grond nat met water.



Moenie harde geluide maak op die terrain nie, veral naby skole en huise.

Meld raserye voertuie aan of herstel dit.



Gebruik die toilette wat voorsien is.
Meld vol of lekkende toilette aan.



Et slegs in gemerkte gebiede.

Moenie naby riviere of strome eet nie.

Gooi verpakking en orige kos in vullisblikke.



Moenie vullis rondstrooi nie - gooi alle vullis (veral sementsakke) in vullishouers.

Mel vol vullishouers aan by u toesighouer.

Vullishouers moet gereeld leeggemaak word.



Moet nooit die speedperk oorskry nie.

Bestuurders - geen voertuie na en meld lekkasies of rokerige voertuie aan.

Maak seker dat alle wagte stewig is en nie mors nie.



Maak seker dat u alle nood telefoonnommers ken.



Boetes tussen R20 en R2000

Verwydering vanaf die konstruksieterrain.

Konstruksie mag gestop word.



Meld alle brakasies, vuur, vloede, lekkasies en beserings aan by u toesighouer.

Vra veel

EMAZENZIWE NE MAZINGENZIWA



Abasebenzi nezibhobo abenziwebenziweyo mabangaphumi nazo ngaphaya kwesayiti



Sukugqibha okanye usele amanzi omlambo
Sukugalela loli, petrol, diesel, concrete okanye inkukuma emlanjeni
Sukonakalisa iindonga (zomlambo) okanye izityalo



Khusela izikwanyana ezilapho esayitini
Xela i-supervisor ukuba zinklwe ezozikwanyana



Ungonakalisi okanye ugawule imithi ngaphandle kwamvume
Sukwamba izityalo



Xa ugqibile ukutshaya galela emqomeni (izitompzi zecuba)
Sukutshaya kufuphi ngesi, ipayinti na petrol
Sukubasa umlilo ngaphandle kwamvume
Zazi izolima mihle apho zidhoyo
Sukutshisa inkukuma ngaphandle kwamvume



Sebenzisa i-petrol, oil na diesel endaweni yayo
Faka izitya sokukhonzela phansi kwamashini
Ungagaleli oil emlanjeni



Zama ungenzi uthuli fefe ngamanzi emhlabeni



Sukwenza ingqalelo eshayitini ngakumbi kufuphi nezikole nazi ndlu
Yezisa ukungqalelo izithuthi esonakeleyo



Sebenzisa i-toilet (izindlu zangasese)
Xela xa zizeleyo



Tyela iwindawo eyenziwe oko
Sukutyela kufuphi nomlambo
Lahla emqomeni yonke inkukuma



Sulahlia inkukuma phantsi
Galela emqomeni yonke inkukuma xela xa izole imiqomo
Xela xa umqomo usele



Qina izitya
umqhubi makayilungise ingqalelo xa yonakale
Qnonondisa umthwalo ubotshibe
enqwelani



Zazi iimbalo zangozi



Intlawulo ngokwephula umthetho yi R20 - R2000
Okanye upothwe amasebenzini
Contract loyo imlwe



Ripota wonke umanakalo ofana nokuphokeza,
iziphango umlilo, ukuzisa kwamashini nangozi lwi
supervisor
Buza xa unombuzo

APPENDIX C:
LIST OF FINES

LIST OF FINES

SCHEDULE OF FINES FOR ENVIRONMENTAL DAMAGE OR EMP TRANSGRESSIONS

Note: The maximum fine for any environmental damage will never be less than the cost of applicable environmental rehabilitation.

CEMP TRANSGRESSION OR RESULTANT ENVIRONMENTAL DAMAGE	MIN. FINE	MAX. FINE
Failure to comply with prescriptions regarding appointment of an Environmental Officer and monitoring of Construction EMP compliance.	R500	R1000
Failure to comply with prescriptions regarding environmental awareness training.	R500	R5000
Failure to comply with prescriptions regarding method statements.	R500	R5000
Failure to report environmental damage or EMP transgressions to the RE or ECO.	R500	R1000
Failure to carry out instructions of the RE or ECO regarding the environment or the Construction EMP.	R500	R1000
Failure to comply with prescriptions posting of emergency numbers.	R500	R5000
Failure to comply with prescriptions regarding a complaints register.	R500	R1000
Failure to comply with prescriptions regarding information boards.	R500	R1000
Failure to comply with prescriptions regarding site demarcation and enforcement of 'no go' areas.	R500	R5000
Failure to comply with prescriptions regarding site clearing.	R500	R5000
Failure to comply with prescriptions for supervision for loading and off loading of delivery vehicles.	R500	R1000
Failure to comply with prescriptions for securing of loads to ensure safe passage of delivery vehicles.	R500	R1000
Failure to comply with prescriptions for the storage of imported materials within a designated contractor's yard.	R500	R1000
Failure to comply with prescribed administration, storage or handling of hazardous substances.	R500	R1000
Failure to comply with prescriptions regarding equipment maintenance and storage.	R500	R1000
Failure to comply with fuel storage, refuelling, or clean-up prescriptions.	R500	R1000
Failure to comply with prescriptions regarding procedures for emergencies (spillages and fires).	R1000	R5000
Failure to comply with prescriptions regarding construction camp.	R500	R5000
Failure to comply with prescriptions for the use of ablution facilities.	R500	R1000
Failure to comply with prescriptions regarding water provision.	R500	R1000
Failure to comply with prescriptions for the use of designated eating areas, heating source for cooking or presence of fire extinguishers.	R500	R1000
Failure to comply with prescriptions regarding fire control.	R500	R5000
Failure to comply with prescriptions for solid waste management.	R500	R5000
Failure to comply with prescriptions to prevent water pollution and sedimentation	R500	R5000
Failure to comply with prescriptions to the protection of natural features, flora, fauna and archaeology.	R500	R5000
Failure to comply with prescriptions regarding speed limits.	R500	R1000
Failure to comply with prescriptions regarding noise levels of construction activities.	R500	R5000
Failure to comply with prescriptions regarding the Heritage Management Plan.	R500	R5000
Failure to comply with prescriptions regarding working hours.	R500	R5000
Failure to comply with prescriptions regarding aesthetics.	R500	R1000
Failure to comply with prescriptions regarding dust control.	R500	R1000
Failure to comply with prescriptions regarding security and access onto private property	R500	R1000
Failure to comply with prescriptions regarding cement and concrete batching	R500	R5000

For each subsequent similar offence committed by the same individual, the fine shall be doubled in value to a maximum value of R50,000.

VOLUME 2:

**OPERATION ENVIRONMENTAL
MANAGEMENT PROGRAMME**

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List of acronyms:

DEA	Department of Environmental Affairs
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
ELM	Emthanjeni Local Municipality
EMC	Environmental Monitoring Committee
EMP	Environmental Management Programme

1. AIMS OF THE OPERATION EMP

The purpose of the Operation Environmental Management Programme (EMP) is to ensure that impacts on the environment associated with the operation phase are prevented and, where they cannot be prevented, are kept to a minimum and rehabilitated. The Operation EMP sets environmental targets and reasonable standards against which the Proponent's performance can be measured.

2. ADMINISTRATION AND REGULATION OF ENVIRONMENTAL OBLIGATIONS

2.1 ROLES AND RESPONSIBILITIES

Formal roles and responsibilities are necessary to ensure that key procedures are executed. Specific responsibilities of the key role-players during the operation phase are presented below.

2.1.1 DEPARTMENT OF ENVIRONMENTAL AFFAIRS

The Department of Environmental Affairs (DEA) is the designated authority responsible for authorising the Operation EMP. DEA has overall responsibility for ensuring that the Proponent complies with the Operation EMP.

DEA shall also be responsible for approving any amendments that may be required to the Operation EMP.

2.1.2 PROPONENT

The Proponent (Business Venture Investments 1421 (Pty) Ltd) is ultimately responsible for the implementation of the Operation EMP, as well as the financial cost of all environmental control measures. The Proponent shall address any site problems pertaining to the environment at the request of DEA or the landowner.

2.1.3 LANDOWNER

The landowner will continue to farm and operate their guesthouse on site. The landowner shall address any site problems relating to existing and continued land uses at the request of the Proponent.

2.1.4 ENVIRONMENTAL MONITORING COMMITTEE

The establishment of Environmental Monitoring Committee (EMC) during the operation phase should be investigated, in consultation with the Emthanjeni Local Municipality (ELM), in order to monitor the implementation of the Operation EMP. The forum should include representatives from the local community, local councillors, farmers and the Proponent. If it is decided to establish an EMC, the frequency of the meetings should also be determined in consultation with the ELM.

2.2 INTERNAL REVIEW AND AUDITING

An internal review procedure shall be established by the Proponent to monitor the progress and implementation of the Operation EMP. Where and when necessary, procedures that require modification shall be changed to improve the efficiency of the Operation EMP. Any significant changes or adjustments to the Operation EMP shall be registered and included in an updated Operation EMP document. The updated Operation EMP shall be submitted to DEA for approval.

2.3 LICENCES

The Proponent shall ensure a Water Use Licence has been issued by the Department of Water Affairs (Northern Cape Regional Office) for the abstraction and use of groundwater during operation.

3. ENVIRONMENTAL SPECIFICATIONS

3.1 WASTE MANAGEMENT

3.1.1 SOLID WASTE

The Proponent shall be responsible for the establishment of a solid waste control and removal system in order to prevent the spread of waste (including litter) in, and beyond, the site.

All waste shall be temporarily stored in a dedicated waste disposal area on site, which is screened from the farmstead and public roads.

Wherever possible, an integrated waste management approach shall be used, based on the principles of waste minimisation, reduction, reuse and recycling of materials. In this regard, recyclable items shall be separated from other waste. Separate containers shall be provided for waste food / produce, glass, metal, plastic and cardboard / paper in the waste control area.

All recyclable waste shall be transported to a recycling facility that is able to handle the waste generated. All non-recyclable domestic waste (e.g. surplus food, food packaging, organic waste, etc.) shall be removed from site on a weekly basis (or sooner) for disposal at a licensed landfill site. No solid waste of any kind (including garden refuse) shall be burnt or buried on site.

The waste disposal area shall be kept neat and tidy at all times.

3.1.2 HAZARDOUS WASTE

All hydrocarbon (e.g. fuel, oils and contaminated soil / materials) and other hazardous waste (e.g. herbicides, pesticides, bitumen, tar, etc.) resulting from spills, refuelling and maintenance activities shall be disposed of in a licensed hazardous waste site or, where possible, sold to an approved used-oil recycling company. The Proponent shall keep records of disposal certificates on site.

Used oil, lubricants, cleaning materials, etc. from the maintenance of vehicles and machinery shall be collected and stored in bunded holding tanks / contamination drums prior to disposal.

No hydrocarbon and hazardous waste shall be burnt or buried on site.

3.1.3 WASTEWATER

The Proponent shall ensure that water runoff from refuelling areas, workshops and vehicle washing areas passes through an oil separation / settlement system before being released or alternatively is directed into a conservancy tank for disposal off site at a location approved by the local authority.

3.2 WATER MANAGEMENT

3.2.1 WATER USE

The Proponent shall undertake groundwater tests (including drawdown tests and 48 hr constant discharge pumping tests) on at least four existing boreholes in order to determine the exact borehole yields and the most appropriate pumping regime.

Where possible, multiple boreholes shall be used for shorter durations, as this would reduce the extent of the radius of influence.

3.2.2 STORMWATER

The Proponent shall ensure compliance with the stormwater management plan, which includes the following:

- All existing drainage channels are to be incorporated into the stormwater drainage system;
- Stormwater is to be, where possible, directed into natural vegetated areas;
- The stormwater drainage channel along the N10 and a portion of the existing dam (size to be determined by estimated stormwater volume for the developed site) in the north-western corner of the site are to be retained in the proposed buffer along the N10. The formalised drainage channel may need to be moved slightly to accommodate the proposed berm; and
- Overflow from the dam is to continue down the existing drainage channel and under the N10.

Stormwater infrastructure (e.g. culverts and drains) shall be inspected and maintained on a regular basis to ensure it does not become blocked with alien vegetation, sediment and debris.

3.3 REFUELLING, MAINTENANCE AND SPILLS/LEAKS

3.3.1 REFUELLING

Vehicles and equipment shall be refuelled in a demarcated maintenance / servicing area. Drip trays shall also be used during refueling.

3.3.2 MAINTENANCE

Ideally only water should be used for the cleaning the modules / solar arrays. However, if a soap or detergent is required, then a biodegradable and environmentally-friendly product shall be used.

Nests or signs of nesting in or on modules / solar arrays shall to be removed during regular maintenance activities.

All vehicles and equipment shall be kept in good working order and serviced regularly. Leaking equipment shall be repaired immediately. Where reasonably practical, maintenance activities shall only be undertaken in a demarcated maintenance area, which has a low permeability, bunded surface. When servicing equipment, drip trays shall be used to collect the waste oil and other lubricants. All hazardous waste from maintenance activities shall be disposed of as specified in Section 3.1.2.

The maintenance and storage areas shall be screened by buildings, walls, hedges and/or tree planting, and shall be kept in a tidy state.

3.3.3 ACCIDENTAL SPILLS AND LEAKS

The Proponent shall ensure that his / her employees are aware of the procedure to be followed for dealing with spills and leaks. In the event of a hydrocarbon spill, the source of the spillage shall be isolated and the spillage contained. The area shall be cordoned off and secured.

The Proponent shall ensure that there is always a supply of absorbent material readily available to absorb / breakdown spills. The quantity of such materials shall be able to handle the total volume of the hydrocarbon / hazardous substance stored on site.

Hydrocarbon contaminated material and / or soil shall be collected and stored in a bunded area until future disposal (see Section 3.1.2).

3.4 EROSION AND SEDIMENTATION CONTROL

The Proponent shall protect areas susceptible to erosion by installing necessary temporary and permanent drainage works and by taking measures necessary to prevent surface water from being concentrated in streams and from scouring slopes, banks or other areas.

Any runnels or erosion channels that developed as a result of the project shall be backfilled and compacted. Cleared areas shall be stabilised by the following methods (or combination thereof):

- Brushcut packing (although no alien plant material may be used for this purpose);
- Mulch or chip cover (although no alien plant material may be used for this purpose);
- Straw stabilising (at a rate of one bale/m² rotated into the top 100 mm of the completed earthworks – only straw bales held with string (not wire) may be used);
- Watering;
- Planting/sodding;
- Hand seeding/sowing;
- Application of soil binders and anti-erosion compounds; and/or
- Mechanical cover/packing structures (including the use of Geofabric, hessian cover, log/pole fencing).

3.5 ALIEN ERADICATION

Invasive alien vegetation that establishes itself on site, particularly within the drainage channels, shall to be monitored and removed on an ongoing basis.

3.6 FIRE CONTROL

The Proponent shall take all reasonable steps to prevent the accidental occurrence or spread of fire. The Proponent shall ensure that all site personnel are aware of the procedure to be followed in the event of a fire. The local Fire and Emergency Services shall be notified in the event of a fire before it is beyond control.

The Proponent shall ensure compliance with the requirements of the Veld & Forest Fires Act, 1998 (No. 101 of 1998) in terms of establishing a Fire Protection Association with the landowners.

The Proponent shall ensure that there is basic fire-fighting equipment on site at all times. This equipment shall include, but not limited to, water truck, fire extinguishers and beaters.

3.7 PARKING AND ACCESS ROADS

The footprint of parking and access roads shall be clearly defined / demarcated in order to prevent spill over into other areas.

3.8 AESTHETICS AND LIGHTING

The Proponent shall take reasonable measures to ensure that operation activities do not have an unreasonable impact on the aesthetics of the area.

The Proponent shall maintain all screen planting on berm along the N10 and along the Hydra substation road.

The Proponent shall ensure that any lighting installed on the site does not interfere with road traffic or cause a reasonably avoidable disturbance to the farmstead. Lights shall, where possible, be low-level and fitted with reflectors to avoid light spillage.

3.9 OPEN SPACE MANAGEMENT

The landowner shall be allowed to graze small game and / or livestock between the modules / solar arrays, as per the lease agreement. Stocking densities shall comply with the low grazing capacity in the area (i.e. approximately 20-25 ha/large stock unit).

Open space management is also dealt with in Sections 3.4 (erosion and sediment control) and 3.5 (alien eradication).

3.10 EMPLOYMENT

The Proponent shall, where reasonable and practical, implement a 'locals first' employment policy, especially for semi- and low-skilled job categories. In addition, local Contractors/Sub-contractors with BEE criteria shall be considered where possible.

A training and skills development programme for locals shall be implemented during the first five years of operation.

3.11 MONITORING

3.11.1 AVIFAUNA

An avifaunal monitoring programme shall be implemented for the first 12 months of operation in order to contribute to the research database. The monitoring programme shall be undertaken as part of routine maintenance activities. The following shall be recorded:

- Number of bird carcasses encountered around the modules / solar arrays;
- Incidence of nests and nesting attempts; and
- Increase in bird activity and unusual bird aggregations.

Data should be sent to Dr Hanneline Smit of Birdlife Africa (conservation@birdlife.org.za).

3.11.2 GROUNDWATER

The groundwater level, quality and abstraction volume shall be monitored during operation.

3.12 DECOMMISSIONING

3.12.1 SITE REHABILITATION

On completion of the project, the Proponent shall ensure that all access roads, infrastructure, equipment, materials, etc. (not required by the landowner) are removed with minimum damage to the surrounding area.

The Proponent shall appoint a suitably experienced Rehabilitation / Landscaping Contractor to implement the vegetation rehabilitation plan compiled during the construction phase.

3.12.2 RETRENCHMENT

Retrenchment packages are to be provided for all staff that stand to lose their jobs. All retrenchments must comply with the South African labour legislation.