

Wonderpan PV solar site + 132kV transmission line	Site 1 (Preferred alternative): Portion 4 of the Farm Karabee 50, Prieska Road	C0600000000005000004
132kV transmission line	The Remaining Extent of Portion 8, Prieska Road	C0600000000005000008

Table 3 Node coordinates of the Wonderpan solar site and the proposed 132kV transmission line. Refer to **Figure 3** for a visual representation of the site and transmission line's overall layout.

Wonderpan PV solar site		
Node No	Lat	Lon
1	29° 48' 18.00" S	22° 51' 6.99" E
2	29° 48' 4.14" S	22° 51' 7.01" E
3	29° 47' 44.54" S	22° 51' 18.08" E
4	29° 48' 26.49" S	22° 52' 2.93" E
5	29° 48' 37.71" S	22° 51' 4.13" E
132kV transmission line		
Node	Lat	Lon
1	29° 42' 21.32" S	22° 51' 17.20" E
2	29° 42' 43.48" S	22° 51' 0.24" E
3	29° 43' 1.53" S	22° 51' 38.38" E
4	29° 46' 3.65" S	22° 52' 50.13" E
5	29° 46' 7.49" S	22° 52' 43.61" E
6	29° 46' 18.57" S	22° 52' 37.98" E
7	29° 46' 58.69" S	22° 52' 9.40" E
8	29° 47' 8.26" S	22° 51' 57.06" E
9	29° 47' 52.56" S	22° 51' 26.64" E
10	29° 42' 6.91" S	22° 50' 43.64" E
11	29° 41' 51.03" S	22° 49' 55.87" E



2. Role players and responsibility matrix:

In order for the EMP to be successfully implemented, all the role players involved in the project need to co-operate. For this to happen, role players must clearly understand their roles and responsibilities in the project, must be professional, form respectful and transparent relationships, and maintain open lines of communication.

Table 1: Functions and Responsibilities of Project Team

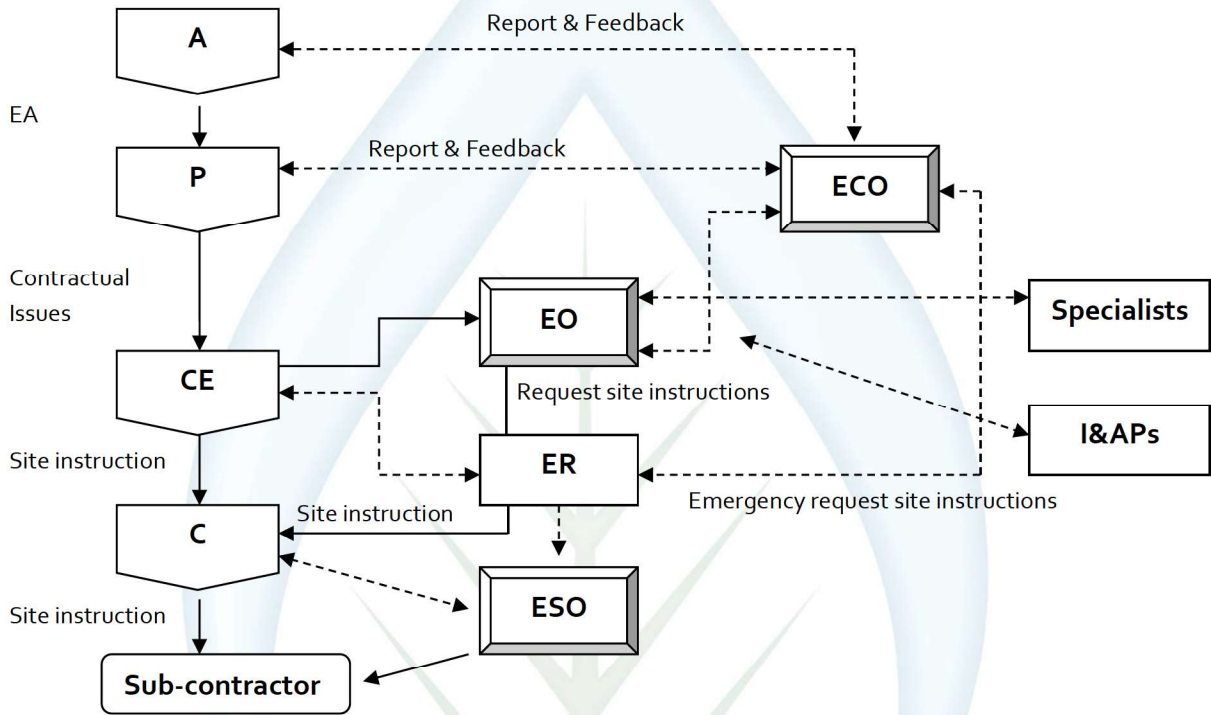
Key	Function	Responsibility
P	Proponent	Proponent is ultimately accountable for ensuring compliance to the EMP. The ECO must be contracted by the Proponent (full time or part time depending on the size of the project) as an independent appointment to objectively monitor implementation of relevant environmental legislation, conditions of the EMP for the project. The Proponent is further responsible for providing and giving mandate to enable the ECO to perform responsibilities. The developer must ensure that the ECO is integrated as part of the project team.
CE	Consulting Engineer	Contracted by the developer to design and specify the project engineering aspects. Generally, the engineer runs the works contract. The CE may also fulfil the role of Project Manager on the proponent's behalf (See PM).
PM	Project Manager	The Project Manager has over-all responsibility for managing the project, contractors, and consultants and for ensuring that the environmental management requirements are met. The CE may also act as the PM. All decisions regarding environmental procedures must be approved by the PM. The PM has the authority to stop any decommissioning activity in contravention of the EMP in accordance with an agreed warning procedure.
ER	Engineers Representative	The consulting engineer's representative on site. Has the power/mandate to issue site instructions and in some instances, variation orders to the contractor, following request by the EO or ECO. The ER oversees site works, liaison with Contractor and ECO.
EO/EM	Environmental Officer / Environmental Manager	Appointed by the Consulting Engineers as their environmental representative on site. The EO is not independent but must rather act on behalf of the consulting engineers with the mandate to enforce compliance under the project contract, which must include the EMP. The EO has the directive to issue non-conformance and hazard certificates. Further, in terms of accepted industry practice the EO could issue the equivalent of a "cease works" instruction only in exceptional circumstances where serious environmental harm has been or is about to be caused i.e. in

		<p>cases of extreme urgency and then only when the ER is absent.</p> <p>The EO must form part of the project team and be involved in all aspects of project planning that can influence environmental conditions on the site. On certain types of projects, such as linear developments (fences, pipelines, etc), the EO must also be the liaison between the contractor and landowners.</p> <p>The EO must attend relevant project meetings, conduct daily inspections to monitor compliance with the EMP, and be responsible for providing reports and feedback on potential environmental problems associated with the development to the project team and ECO.</p> <p>The EO must convey the contents of this EMP to the Contractor site team and discuss the contents in detail with the Contractor as well as undertake to conduct an induction and an environmental awareness training session prior to site handover to all contractors and their workforce.</p> <p>The EO must be suitably experienced with the relevant qualifications and preferably competent in construction related methods and practices.</p>
ECO	Environmental Control Officer	<p>An independent appointment to objectively monitor implementation of relevant environmental legislation, conditions of Environmental Authorisations (EA's), and the EMP for the project. The ECO must be on site prior to any site establishment and must endeavour to form an integral part of the project team.</p> <p>The ECO must be proactive and have access to specialist expertise as and when required, these include botanists, ecologists, etc. Further, the ECO must also have access to expertise such as game capture, snake catching, etc.</p> <p>The ECO must conduct audits on compliance to relevant environmental legislation, conditions of EA, and the EMP for the project. The size and sensitivity of the development, based on the EIA, will determine the frequency at which the ECO will be required to conduct audits. (A minimum of a monthly site inspection must be undertaken).</p> <p>The ECO must be the liaison between the relevant authorities and the project team. The ECO must communicate and inform the developer and consulting engineers of any changes to environmental conditions as required by relevant authoritative bodies. The ECO must ensure that the registration and updating of all relevant EMP documentation is carried out.</p> <p>The ECO must be suitably experienced with the relevant environmental management qualifications and preferably competent in construction related methods and practices.</p>

		<p>The ECO must handle information received from whistle blowers as confidential and must address and report these incidences to the relevant Authority as soon as possible.</p> <p>On small projects, where no EO is appointed, the ECO must convey the contents of this EMP to the Contractor site team and discuss the contents in detail with the Contractor as well as undertake to conduct an induction and an environmental awareness training session prior to site handover to all contractors and their workforce.</p>
C	Contractor	<p>The principle contractor, hereafter known as the ‘Contractor’, is responsible for implementation and compliance with the requirements of the EMP and conditions of the EA’s, contract and relevant environmental legislation. The Contractor must ensure that all sub-contractors have a copy of and are fully aware of the content and requirements of this EMP.</p> <p>The contractor is required, where specified, to provide Method Statements setting out in detail how the management actions contained in the EMP will be implemented.</p>
ESO	Environmental Site Officer	<p>The ESO is employed by the Contractor as his/her environmental representative to monitor, review and verify compliance with the EMP by the contractor. This is not an independent appointment; rather the ESO must be a respected member of the contractor’s management team.</p> <p>Dependent on the size of the development the ESO must be on site one week prior to the commencement of construction. The ESO must ensure that he/she is involved at all phases of the construction (from site clearance to rehabilitation).</p>
A	Lead Authority	<p>The authorities are the relevant environmental department that has issued the Environmental Authorisation. The authorities are responsible for ensuring that the monitoring of the EMP and other authorisation documentation is carried out, this will be achieved by reviewing audit reports submitted by the ECO and conducting regular site visits.</p>
OA	Other Authorities	<p>Other authorities are those that may be involved in the approval process of an EMP. Their involvement may include reviewing EMP’s to ensure the accuracy of the information relevant to their specific mandate.</p> <p>Other authorities may be involved in the development, review or implementation of an EMP.</p> <p>For example, if a specific development requires a water use licence for the relevant national authority then that authority should review and comment on the content of the particular section pertaining to that mandate.</p>
EAP	Environmental Assessment Practitioner	<p>The definition of an environmental assessment practitioner in Section 1 of NEMA is “<i>the individual responsible for the planning, management and coordination of environmental impact assessments, strategic environmental assessments,</i></p>

environmental management plans or any other appropriate environmental instruments introduced through regulations”.





2.1. Recommended formal environmental communication channels:



EMG

3. Objectives of the EMP:¹

The specific objectives of this EMP are to:

-  To provide explicit operational guidelines and environmental monitoring requirements during the construction phases so that activities are done in environmentally responsible and sustainable manner.
-  To benefit the host communities, minimise the impacts on the environment and to ensure the health and safety of the community by creating a development that eliminates unacceptable health hazards and ensures public and animal safety.
-  To enable proponent and its contractors to use resources efficiently and effectively during the project lifecycle in order to reduce wastage and thereby reduce associated negative environmental impacts. In addition, the aim is also to handle waste streams responsibly and apply the 'reduce, re-use and recycle' principle, wherever possible
-  To leave areas disturbed by construction in a rehabilitated, stable, non-polluting and tidy condition.






4. Activities covered by the EMP:

4.1. Planning stage:

The project planning stage consists of layout design surveying and ensuring that all plans and required contracts, permits/ licenses and agreements are set in place.

4.2. Construction phase:

The construction phase will start after the relevant authorizations are granted. The construction phase involves earthwork, structure development, service provision and finishing. The construction phase will start after the relevant authorizations are granted. This phase includes:

-  transportation of construction material and other resource inputs;
-  use of heavy construction equipment on site;
-  storage of input materials and disposal of waste generated;
-  construction of building structures;
-  rehabilitation of the disturbed areas through:
 - demolition/removal of any unwanted construction fences and infrastructure;
 - top-soiling and re-vegetation of areas disturbed by construction.

4.3. Operation phase

The operational phase is initiated following the completion of construction and the go-ahead of the proponent/ developer. This phase typically involves a smaller, more direct








¹ The implementation of the EMP is not an additional or "add on" requirement. The EMP is legally binding through NEMA.

workforce which maintains operational activities. Routine and corrective maintenance on electrical infrastructure will be undertaken during this phase. Maintenance activities will need to be carried out throughout the lifetime of the project. Maintenance activities may include:






-  Washing of PV panels
-  Replacement of equipment
-  Vegetation growth control
-  Routine inspections
-  Refurbishment of equipment / general maintenance.

5. Identification of environmental aspects and impacts:

The contractor shall identify likely aspects before commencing with any construction activity. Examples of environment aspects include:

-  Waste generation
-  Storm water discharge
-  Chemical use operations
-  Energy use operations
-  Water use operations
-  Use of natural resources
-  Noise generation

Thereafter the contractor shall programme his work in such a way that each cause and effect of a construction activity is also identified and the activity planned so as to prevent any impacts from happening. If prevention is not practicable, or in the event of mishap or misapplication, the contractor shall provide plans and measures for the engineer's approval, which will limit and contain the magnitude, duration and intensity of the impact. The contractor shall demonstrate that he is capable of carrying out any repair and reinstatement of the damaged environment. Listed below are some environmental impacts that could adversely alter an aspect of the environment through usual construction activities:

-  Pollution of atmosphere, soil or water
-  Destruction or removal of fauna and flora and effect on biological diversity
-  Deformation of the landscape
-  Soil erosion
-  Effect on the built environment

6. Legal requirements:

6.1. General:

Construction activities will be according to the best industry practices, as identified in the project documents. This EMP, which forms an integral part of the contract documents, informs the contractor as to his duties in the fulfilment of the project

objectives, with particular reference to the prevention and mitigation of environmental impacts caused by Construction activities associated with the project. The contractor should note that obligations imposed by the EMP are legally binding in terms of environmental statutory legislation and in terms of the additional conditions to the general conditions of contract that pertain to this project. In the event that any rights and obligations contained in this document contradict those specified in the standard or project specifications then the latter shall prevail.

6.2. Statutory and other applicable legislation:

The contractor is deemed to have made himself conversant with all legislation pertaining to the environment, including provincial and local government ordinances, which may be applicable to the contract.

7. Record keeping:

All records related to the implementation of this management plan (e.g. site instruction book and method statements) must be kept together in an office where it is safe and can be retrieved easily. These records should be kept for a minimum of two years and should at any time be available for scrutiny by any relevant authorities.

It is recommended that photographs are taken of the site **prior to, during** and **immediately after construction** as a visual reference. These photographs should be stored with other records related to this EMP.

7.1. Compliance and penalties:

The contractor shall act immediately when a notice of non-compliance is received, correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the construction site pertaining to the environment shall be recorded in a dedicated register, and the response noted with the date and action taken.

Any non-compliance with the agreed procedures of the EMP is a transgression of the various statutes and laws that define the manner by which the environment is managed; therefore, any avoidable non-compliance, dependant on severity, shall be considered sufficient grounds for contact to be made with relevant provincial or national authorities.

The responsible provincial or national authorities shall ensure compliance and impose penalties relevant to the transgression as allowed for within its statutory powers.

7.2. Report availability:

Copies of this EMP shall be kept at the construction site office and will be accessible to all senior contract personnel. All senior personnel working on the project shall be required to familiarise themselves with the contents of this document.

8. Environmental mitigation specifications for impacts:

8.1. Social environmental issues:

It is important to minimize any negative perception, by taking proactive measures to prevent any social conflicts or social gaps and to develop a positive attitude within the community of the project. The following management strategies are to be implemented:

- 🔦 Transparent fair recruitment and procurement practices. The contractor chosen should maximize the involvement of local communities in construction and support activities, to the extent possible, based on available skill levels. Whenever possible, training programmes that will benefit both construction stage skills requirements and long-term employment demand should be developed.
- 🔦 The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.
- 🔦 Priority should be given to the local suppliers of goods and services, which meet requirements of project procurement as far as is possible. In order to optimize the opportunities for local businesses to supply goods and services to the project, the contractor will do a survey of the capabilities of the goods and services that are locally available that are of an acceptable standard and quality and a survey of the capabilities of local construction companies and identify opportunities for local suppliers.
- 🔦 A public complaint register and system to ensure that community complaints clearly investigated and adequate remedial taken should be instituted.
- 🔦 Adequate notification should be done to people residing close to where construction activities are taking place especially if they are to be affected by them. In addition, there should be a system of compensation for any damages to infrastructure that may occur.
- 🔦 Each worker should be required to abide by a Code of Conduct which will limit unsavoury activities in local towns and communities and restrict certain behaviours in the work sites and accommodation.

8.2. Fencing:

- 🔦 Increasing the perimeter fence's spacing between at least the top two wires (to a minimum of 30cm) and ensuring they are correctly tensioned will reduce the snaring risk for owls.
- 🔦 A single perimeter fence is preferred.
- 🔦 During the first few weeks of construction, fencing should be adapted to allow wildlife to migrate to other open spaces.
- 🔦 Electric fencing near the ground should not be live to prevent the electrification of small animals.

- 🔹 Monthly inspections and recordings of all animal mortalities around the perimeter fence should be conducted on a monthly basis.
- 🔹 Mortalities need to be reported to the on-site environmental representative.
- 🔹 Fencing of the campsite and construction area (if applicable) shall be suitably secured to prohibit access by livestock and local fauna.
- 🔹 No unauthorised pedestrian or vehicular access shall be allowed into fenced off-limits areas.
- 🔹 Fencing shall be kept neat at all times. The contractor shall be responsible for the maintenance of all fences.
- 🔹 If temporary fencing is removed temporarily for the execution of work, the contractor shall reinstate it as soon as practicable.
- 🔹 Breaches in the fencing must be repaired immediately.
- 🔹 The purpose of the fenced areas is to control construction and personnel activity within the designated areas, and limit unauthorised access.
- 🔹 No fences or gates that provide access to the site/construction campsite may be cut, lowered, removed or damaged in any way.
- 🔹 Leave private gates, as they are found (open or closed). Gates to adjacent properties or onto public roads must be closed at all times.
- 🔹 Open gates must be guarded to prevent animals from straying onto adjacent camps, roads or properties.

Operation:

- 🔹 Electric fencing near the ground should not be live to prevent the electrification of small animals.
- 🔹 Monthly inspections and recordings of all animal mortalities around the perimeter fence should be conducted on a monthly basis.
- 🔹 Mortalities need to be reported to the on-site environmental representative.
- 🔹 Breaches in the fencing must be repaired immediately.

8.3. Clearing and grubbing:

- 🔹 Contractor shall at all times carefully consider what machinery is appropriate to the task while minimising the extent of environmental damage.
- 🔹 Topsoil shall be cleared of woody vegetation and specifically exotic vegetation before ripping and removing.
- 🔹 The topsoil is regarded as the top 300 mm of the soil profile irrespective of the fertility appearance.
- 🔹 Topsoil is to be stripped when it is in as dry a condition as possible in order to prevent compaction.
- 🔹 No disturbance is allowed near the riparian habitat which stretches along the site's western border.
- 🔹 The topsoil, including the existing grass cover is to be shallowly ripped (only the depth of the topsoil) before removal. This is to ensure that organic plant material, and the natural seed base is included in the stripping process.

- 🔹 Soil stockpiles shall not be higher than 2.5 m or stored for a period longer than one year. The slopes of soil stockpiles shall not be steeper than 1m vertical to 2.5m horizontal.
- 🔹 No vehicles shall be allowed access onto the stockpiles after they have been placed.
- 🔹 Stockpiles shall not be allowed to become contaminated with oil, diesel, petrol, garbage or any other material, which may inhibit the later growth of vegetation.
- 🔹 The contractor shall apply soil conservation measures to the stockpiles to prevent erosion. This can include the use of erosion control fabric or grass seeding.
- 🔹 If at any stage of the clearing operations archaeological artefacts are unearthed or identified the relevant organisations are to be contacted immediately to conduct a thorough scientific investigation of the finds.
- 🔹 The works shall be cleared of alien vegetation as identified by the ESA. An effort must be made to remove the entire root system where after the plant shall be left to dry out on a hard surface that will not facilitate the germination of seed.
- 🔹 If applicable, it must be ascertained (in writing) from the landowner concerned whether he wishes to retain the cleared bush, trees and shrubs. If not, they must be removed to the satisfaction of the owner, bearing in mind that it does not contravene waste disposal regulations.
- 🔹 Burning of any material is not permitted under any circumstances.
- 🔹 All unattended trenches/ excavations should be demarcated.

8.4. Establishing office / camp sites:

- 🔹 The area chosen for these purposes shall be the minimum reasonably required and which will involve the least disturbance to vegetation.
- 🔹 Fires will only be allowed in facilities or equipment specially constructed for this purpose. If required by applicable legislation, a fire-break shall be cleared around the perimeter of the camp and office sites.
- 🔹 Lighting and noise disturbance or any other form of disturbance that may have an effect on the landowner/tenant/persons lawfully living in the vicinity shall be kept to a minimum.
- 🔹 High intensity spotlights should be minimised as far as possible.
- 🔹 Light pollution should be minimised by directing spotlights towards the solar farm's interior.
- 🔹 Chemical toilet facilities or other approved toilet facilities should be sited in such a way that they do not cause water or other pollution. The use of existing facilities must take place in consultation with the landowner/tenant.
- 🔹 In cases where facilities are linked to existing sewerage structures, all necessary regulatory requirements concerning construction and maintenance should be adhered to. The facilities must comply with water act requirements.

- 🔗 Adequate signage must be provided and the area must be appropriated secured.
- 🔗 Adequate parking and security should be provided at the campsites.
- 🔗 All formal documentation should be kept at the site office, and be made available during monthly audits.

8.5. Air quality:

The main sources of impact on air quality are mobilization of equipment, land clearing and earthworks. To ensure air quality characteristics of the project area are maintained near the baseline conditions, the following measures shall be done:

- 🔗 Regular inspection and scheduled maintenance of all equipment to ensure that construction vehicles are in good condition, are utilising fuel efficiently and do not smoke.
- 🔗 Periodically watering the bare surfaces and excavations during construction to keep the dust level down.
- 🔗 Slowing down the vehicles carrying the construction materials to reduce dust generation.
- 🔗 Properly wrapping the material truck containers with cover to avoid dust spreads on windy days and prohibiting transport of over loaded trucks.
- 🔗 Providing and using the safety equipment such as dust mask, noise cover for employees who work near the dusty location such as the heavy equipment operators
- 🔗 Optimization of working schedule and work to help to minimize several material vehicle mobilization trips.

8.6. Noise and vibrations:

The primary noise sources will be vehicles and equipment utilized during the construction stage including graders, bulldozers, general purpose vehicles, etc. To manage the impact the following will be done:

- 🔗 Working schedule for the activities with high noise level will be arranged between 08:00 AM to 17:00 PM.
- 🔗 Only well-maintained vehicles and equipment should be operated on-site and all machinery should be serviced regularly during the construction stage.
- 🔗 Avoiding unnecessary simultaneous noisy activities.
- 🔗 No amplified music shall be allowed at the site.
- 🔗 Selecting 'quiet' construction equipment and working method and avoiding unnecessary revving and hooting.
- 🔗 Providing ear protection for activities that are likely to create noise in order to protect worker's health and safety.

8.7. Erosion control:

Construction activities will require the removal of vegetation cover, potentially resulting in soil erosion and subsequent impacts on surface water quality due to uncontrolled rainwater run-off or mechanical/wind action. The following measures are necessary to minimise impacts:

- 🔹 No disturbance is allowed near the riparian habitat which stretches along the site's western border.
- 🔹 Clearance of vegetation should be restricted to the absolute minimum required to facilitate construction activities to proceed. Disturbance of topsoil and vegetation rootstock must be minimized as far as possible.
- 🔹 Areas which are not planned to be constructed within two (2) months must not be cleared so as to reduce risk of erosion.
- 🔹 Construction activities shall take place only within the approved demarcated area. Appropriate drainage facilities must be constructed to make sure water runs smoothly downstream.
- 🔹 Erosion control measures that can be implemented in areas that are susceptible to erosion include:
 - Use of silt fences and sand bags.
 - Brush packing with cleared vegetation
 - Mulch, stone chip packing
 - Planting of vegetation
 - Hydroseeding / hand sowing
- 🔹 Topsoil layer will be kept to rehabilitate and will be adequately stored to protect it from erosion.
- 🔹 Areas where construction has been finished should immediately be rehabilitated up to industry relevant standards.
- 🔹 All structures of the stormwater management plan needs to be inspected on a regular basis.
- 🔹 Any obstruction within the stormwater management plan needs to be removed.

Operation:

- 🔹 No disturbance related activity may occur within 30 m of the riparian habitat which stretches along the site's western boundary.
- 🔹 All structures of the stormwater management plan need to be inspected on a regular basis.
- 🔹 Any obstruction within the stormwater management plan needs to be removed.
- 🔹 Any evidence of soil erosion needs to be followed by the appropriate erosion control such as listed above.

8.8. Contamination of land:

Land contamination may occur as a result of fuel and oil leaks or spills and/or poor fuel, chemical and waste storage. The following measures are necessary to mitigate/avoid the adverse effects of land contamination:






- 🔹 The storage areas shall be securely fenced and appropriately marked to indicate the goods in the storage. Material Safety Data Sheets should be kept for all hazardous materials on site.
- 🔹 All hazardous substances and stocks such as diesel, oils, detergents, etc., shall be stored in areas with impervious flooring such as concrete and properly banded.
- 🔹 Drip pans, other impervious surface, shall be installed in such storage areas with a view to prevent soil and water pollution.
- 🔹 Dedicated impervious areas should be designated for concrete mixing and the spillage from concrete mixed should be cleaned immediately.
- 🔹 The waste management strategy on the construction site should be hinged on the waste hierarchy model of '*reduce, reuse and recycle*' waste in order to reduce the ultimate impact on the environment.
- 🔹 All used oils, grease or hydraulic fluids shall be placed in appropriate impervious containers and these receptacles will be removed from the site on a regular basis for disposal at a licensed disposal facility or sent for recycling/reuse with a registered facility.
- 🔹 Residues from machinery maintenance and other sources contaminated with hazardous waste should be stored in proper containers that avoid seepage to ground.
- 🔹 Spills should be cleaned up immediately by removing the spillage together with the polluted soil and by disposing of them at a recognised facility.
- 🔹 Adequate waste receptacles shall be made available, and all waste shall be adequately stored so that it does not pose a pollution risk.
- 🔹 General waste is to be disposed of through the municipal service. Any other waste will be disposed of through only licensed waste disposal facilities.
- 🔹 Volatile waste items such as plastic bags, cement bags, etc. should be temporarily stored in a suitable manner as to prevent it from being dispersed via wind.

8.9. Surface and ground water quality:

Poor chemical storage and poor waste management practices may lead to the contamination of water sources. Sewage and sanitary effluent have the potential to adversely affect the quality of receiving water bodies unless properly managed. To eliminate the risk of contamination, the following measures have to be instituted:












- 🔹 Suitable covered receptacles for waste shall be available at all times and conveniently placed for the disposal of waste.
- 🔹 Spills or overflows from chemical or other toilets used by construction staff must be dealt with by a sanitation expert immediately.
- 🔹 Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and treated prior to discharge or removed from the site for appropriate disposal at a recognised facility.

8.10. Water usage:

-  Any water that is used which does not emanate from Municipality supplies must be registered and authorised by the Department of Water Affairs prior to usage commencement.
-  The contractor shall promote responsible water use by all personnel.
-  The contractor is requested to notify the Department of Water Affairs in writing of the proposed commencement of construction and provide the department with a construction programme, prior to any work commencing in proximity of a river or riverbank.
-  Any activity which adversely affects sensitive aquatic fauna and flora shall be forbidden.
-  Responsible water usage during cleaning of the facility.

8.11. Fauna and flora:

Fauna and flora are negatively impacted by the clearance of vegetation, noise from construction activities (disturbance) and gathering/ hunting of flora and fauna by workers. The following measures are necessary to mitigate impacts.

-  Clearance of vegetation should be restricted to the absolute minimum required to facilitate access and undertaken construction activities.
-  Vegetation clearance / exotic species eradication should be conducted on a three (3) monthly basis.
-  All removed plant material needs to be disposed off appropriately.
-  All protected plant species will be demarcated using construction netting or any relevant means as to prevent their damage.
-  **No plant species of conservation concern shall be removed/killed/pruned or damaged in any way without a permit or license.**
-  Prior to construction a removal permit for all protected species needs to be obtained. A copy of this permit needs to be present in the environmental file.
-  No trees or shrubs will be felled or damaged for the purpose of obtaining firewood, unless agreed to by the landowner/tenant.
-  Ensure that all cables and connections are insulated to reduce the likelihood of accidental animal electrification.
-  The rehabilitation activities require the re-planting of vegetation in any areas cleared for the construction activities. This will promote soil stability, improve the visual environment and provide faunal habitat.
-  Hunting/gathering/trapping of wild fauna by construction workers must not be permitted.
-  Localized habitat features such as nests, dens or burrow sites should be avoided as much as possible. In addition, care should be taken in working in areas of active nesting, spawning, and feeding areas.

- 🔗 Increasing the perimeter fence's spacing between at least the top two wires (to a minimum of 30cm) and ensuring they are correctly tensioned will reduce the snaring risk for owls.
- 🔗 All open electrical wires need to be insulated to prevent electrocution.
- 🔗 Eskom approved bird flight diverters should be installed on the 132kV overhead line according to the applicable Eskom Engineering Instruction. These devices must be installed as soon as the conductors are strung

Special mitigation measures:

- 🔗 Prior to construction a proper botanical walkthrough needs to be conducted. The walkthrough needs to focus on the potential occurrence of floral SCC.
 - *Tridentea virescens* (**Rare**)
 - *Hoodia officinalis* (**NT**)
- 🔗 Notice boards displaying information on the above mentioned species needs to be placed across the site. These boards need to be maintained until construction is complete.
- 🔗 Information on floral species of conservation concern needs to be included in induction training sessions.
- 🔗 When a floral species of conservation is recorded, the area of occurrence needs to be demarcated. The following procedure needs to be followed:
 - Demarcation of the area of occurrence
 - Observation must be recorded in the environmental file
 - The on-site environmental representative needs to consult a relevant specialist.
 - The provincial department of environmental affairs needs to be consulted regarding the feasibility of relocation.
 - If required by the provincial department of environmental affairs, a relocation plan is to be drafted and executed by a relevant specialist.
- 🔗 Construction of the power line using an approved bird friendly pole/tower design in accordance with the Eskom Distribution Technical Bulletin relating to bird friendly structures. The avifaunal specialist must sign off on the final design.

8.12. Safety:

- 🔗 The Contractor shall be responsible for the protection of the public and public property from any dangers associated with the construction and operation of the road activities.
- 🔗 All work should be handled in accordance with the Occupational Health and Safety Act and adequate safety precautions taken and suitable sanitation facilities provided in line with the requirements of the act. It is the duty of the contractor to ensure that the all protective measures against accidents are done.
- 🔗 Any works/activities which may pose a hazard to humans and/or domestic animals are to be protected or cordoned off and, if appropriate, warning signage erected.

- 🔗 Appropriate security is to be provided at the site to protect equipment and provide for a safe construction site and work areas.
- 🔗 Any damage caused as a result of the construction activities shall be repaired to the satisfaction of the project manager and owner.

8.13. Historical archaeological and heritage impacts:

- 🔗 All construction activities should be restricted to within the boundaries of the footprint.
- 🔗 SAHRA and a qualified archaeologist be consulted immediately in the event of accidental archaeological exposure.
- 🔗 In the unlikely event of accidental archaeological exposure, all excavations should stop immediately.
- 🔗 No loose chance finds such as stone age artefacts (arrow heads, stone flake blades etc.) may be collected.
- 🔗 The on-site environmental representative should consult the appointed ECO regarding any such discoveries.
- 🔗 All construction debris/ waste should be removed from site and may not be deposited in on-site excavated waste pits.

8.14. Rehabilitation:

- 🔗 On completion of operations, all buildings, structures or objects on the camp/office site shall be demolished and removed.
- 🔗 Where office/camp sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped to aerate and promote the infiltration of water.
- 🔗 On completion of operations, the areas shall be cleared of any contaminated soil, which must be dumped as per the waste management plan.
- 🔗 All infrastructure, equipment, plant, temporary housing and roads and other items used during the construction period will be removed from the site and rehabilitated if necessary.
- 🔗 Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the area and disposed of at a registered waste disposal facility. It will not be permitted to be buried or burned on the site.
- 🔗 Disturbed areas should be left in a safe and stable manner. Preventative measures may be necessary to construct adequate drainage structures including ditches and other structures to facilitate the movement of surface water.
- 🔗 Photographs of the camp and office sites, before and during the construction and after rehabilitation, shall be taken at selected fixed points and kept on record.

- 🌿 The disturbed surfaces shall then be ripped or ploughed and the topsoil previously stored shall be spread evenly to its original depth over the whole area. The area shall then be fertilised if necessary (based on a soil analysis).
- 🌿 Exotic species will have to be continually removed to prevent their proliferation.
- 🌿 The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.
- 🌿 If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, there might be need that the soil be analysed and any deleterious effects on the soil arising from the construction operation be corrected and the area be seeded with a seed mix to his or her specification.

8.15. Handling of emergencies:

- 🌿 The contractor should identify all situations that can lead to emergency situations and provide response strategies. The situations should include fire and major chemical spill.
- 🌿 Contact details of all departments/service providers to be contacted in case of an emergency shall be made available to employees.
- 🌿 Equipment for dealing with emergencies such as spill kits, firefighting equipment, first aid boxes etc shall be made available and personnel properly trained in its use.
- 🌿 All staff on site should be trained on how to handle emergency situations and emergency drills/ rehearsals should be conducted periodically to ensure that staff prepared.
- 🌿 All emergencies/ incidents should be reported and distributed to the relevant parties.

8.16. Glare from solar panels:

Even though solar panels are designed to absorb solar radiation, a significant radiance of reflectance/ glare often shine from these panels. High levels of glare/ solar reflectance may pose a significant environmental and safety risk. To limit the adverse effects of intense glare the following measures should be implemented throughout the construction and operational phases:

- 🌿 Panel height needs to be restricted to the minimum allowable height.
- 🌿 If height restrictions are insufficient, tall growing indigenous tree species needs to be planted along the site boundary close to the N10.
- 🌿 If glare becomes a persistent issue, panel tilt needs to be adjusted.
- 🌿 Warning road signs need to be installed, warning road users of a potential medium-high glare zone.
- 🌿 Shaders on the road facing side of solar panels should be considered if other mitigation measures prove to be less effective.
- 🌿 In the unlikely situation that all previous measures prove ineffective, panel tilt should become fixed facing away from the N10.

- 🔗 A complaints register needs to remain on site in which all complaints raised by the general public is to be filed.

9. Electrical infrastructure:

Electrical infrastructure refers to any component forming part of the project which transmits electricity. This includes internal cabling, electrical fencing and the proposed 132kV transmission line.

- 🔗 The facility should prioritise underground cables as much as possible.
- 🔗 Raptor friendly pylon designs need to be implemented and be approved by the avifaunal specialist.
- 🔗 ESKOM approved bird flight diverters need to be installed along the full length of the 132kV transmission line.
 - These devices need to be installed as soon as the conductors are strung.

10. Method statements:

The Contractor shall submit written Method Statements to for all environmentally sensitive aspects of the work. It should be noted that Method Statements must contain sufficient information and detail to mitigate 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 put in place.



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11. Appendices:

11.1. Appendix 1: Maps

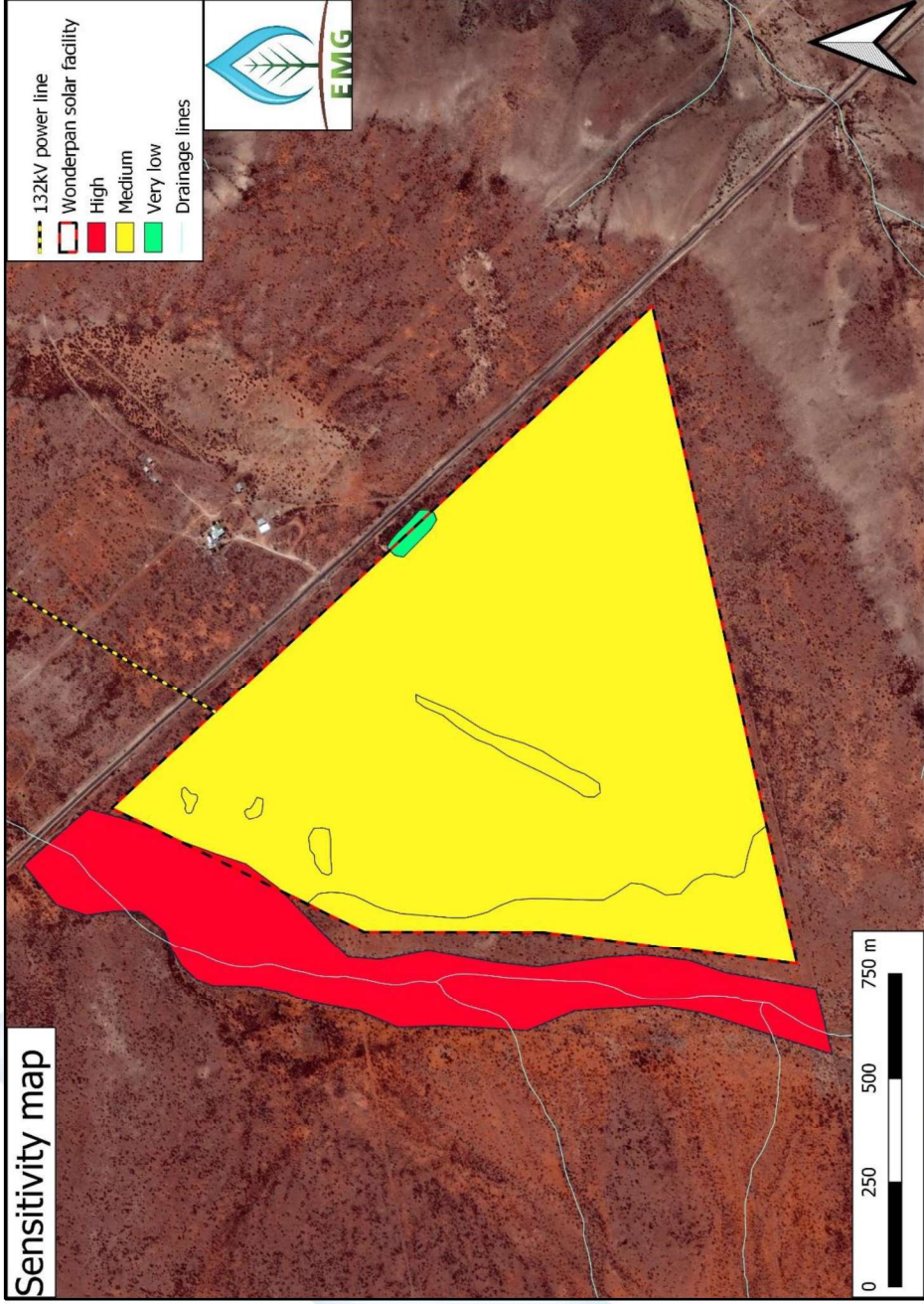


Figure: Combined sensitivity map

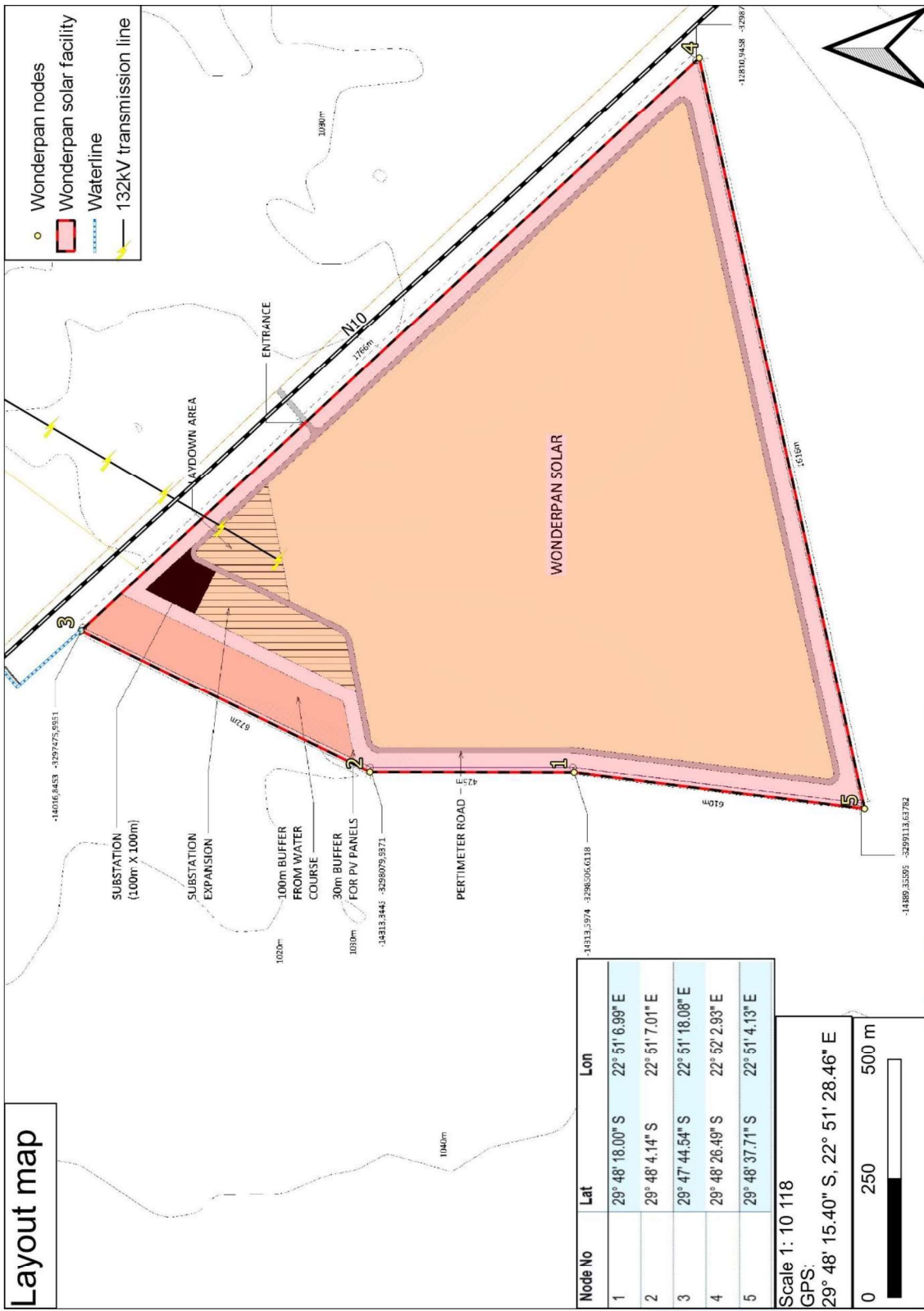



Figure: Proposed site layout area.

11.2. Appendix 2: Protected plants

Several protected species occur on the proposed development site. As such the table below indicate some of these species and the appropriate management action when such species are observed.

	<p>This species is classified as Data Deficient (DDD). A removal permit from the Northern Cape Department: Agriculture, Environmental Affairs, Rural Development and Land Reform (DAERL)'s biodiversity or permit office is required.</p>
	<p>This species is protected under the National Forests Act (Act no 84 of 1998). A removal permit from the National Department of Forestry, Fisheries and the Environment is required.</p>



Hoodia officinalis

This species is very small and tends to grow under the partial shade of other shrubs. It's currently listed as **Near Threatened** and may not be removed. The on site environmental officer needs to consult the DAERL regarding the feasibility of obtaining a removal permit.



Tridentea gemmiflora

A **Rare** succulent species viz. *Tridentea virescens* could possibly be located in the study area. *Tridentea virescens* looks similar to the species on the left. This succulent tends to grow in the partial shade of other shrubs. If observed, the on site environmental officer needs to consult the DAERL regarding the feasibility of obtaining a removal permit



Aloe claviflora

This succulent is a provincially protected species. A removal permit is required from the DAERL's permit office.



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Appendix H
Screening Tool Report

**SCREENING REPORT FOR AN ENVIRONMENTAL AUTHORIZATION AS
REQUIRED BY THE 2014 EIA REGULATIONS – PROPOSED SITE
ENVIRONMENTAL SENSITIVITY**

EIA Reference number:

Project name: 60 MW Wonderpan Solar Facility

Project title: 60 MW Wonderpan Solar Facility

Date screening report generated: 19/10/2022 15:32:38

Applicant: CENEC

Compiler: Environmental Management Group

Compiler signature:
.....

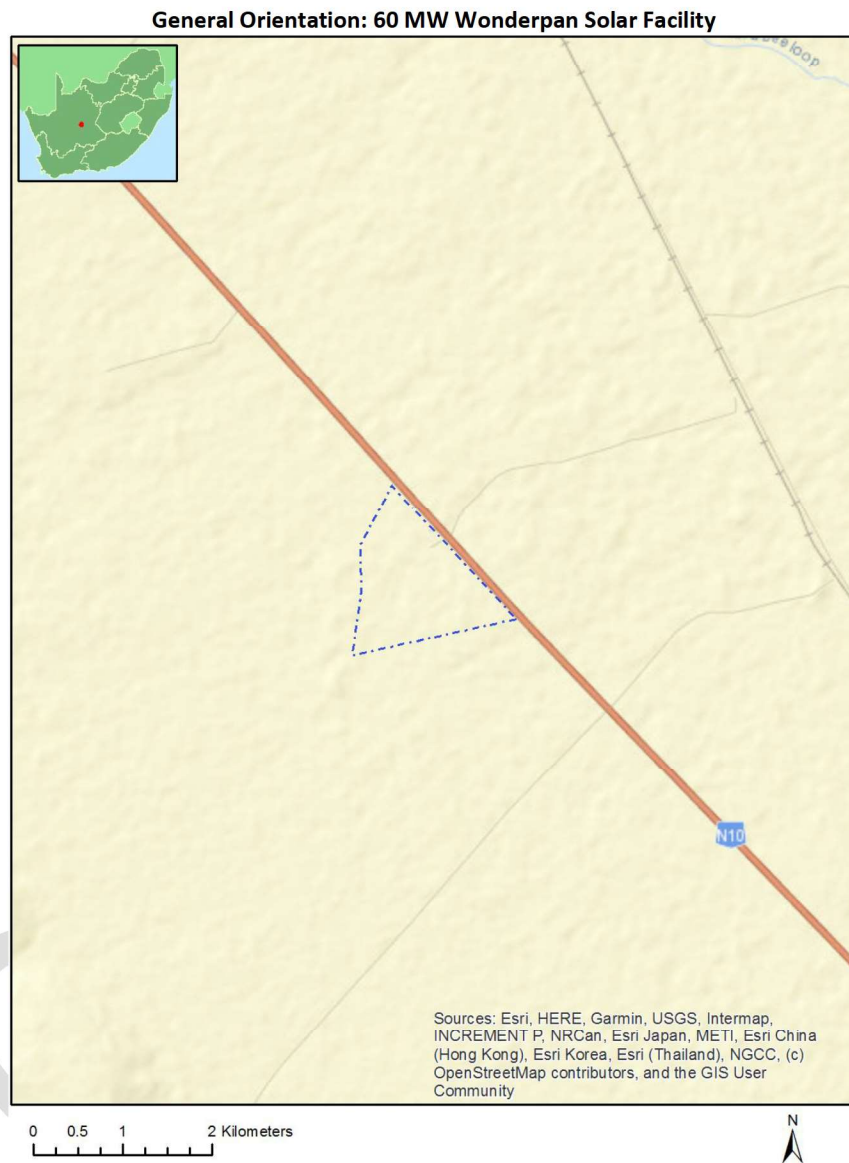
Application Category: Utilities Infrastructure|Electricity|Generation|Renewable|Solar|PV

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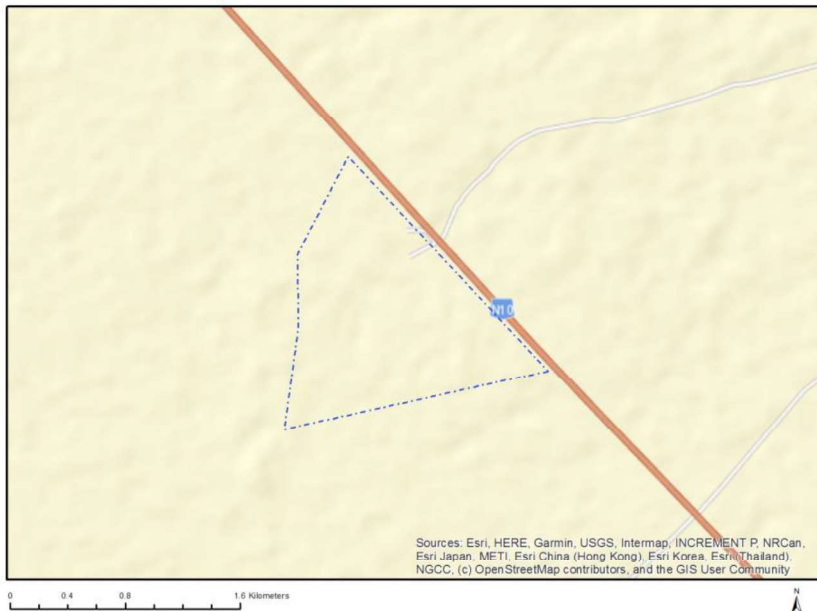
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Proposed Project Location

Orientation map 1: General location



Map of proposed site and relevant area(s)



Cadastral details of the proposed site

Property details:

No	Farm Name	Farm/ Erf No	Portion	Latitude	Longitude	Property Type
1	KARABEE	50	0	29°45'41.52S	22°51'44.96E	Farm
2	KARABEE	50	4	29°48'20.34S	22°49'35.67E	Farm Portion

Development footprint¹ vertices:
No development footprint(s) specified.

Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area

No	EIA Reference No	Classification	Status of application	Distance from proposed area (km)
1	14/12/16/3/3/2/345	Solar PV	Approved	9.5
2	14/12/16/3/3/1/981	Solar PV	Approved	10.3
3	14/12/16/3/3/1/1475	Solar PV	Approved	15.3
4	14/12/16/3/3/2/937	Solar PV	Approved	4.3

¹ "development footprint", means the area within the site on which the development will take place and includes all ancillary developments for example roads, power lines, boundary walls, paving etc. which require vegetation clearance or which will be disturbed and for which the application has been submitted.