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PROPOSED SUN GARDEN PHOTOVOLTAIC FACILITY, EASTERN CAPE

TRANSPORT STUDY

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First Issue

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SYNOPSIS

Preparation of a Transport Study for the Proposed Sun Garden Photovoltaic Facility, located approximately 36km south-east of Somerset East and 28km south-west of Cookhouse in the Eastern Cape, pertaining to all relevant traffic and transportation engineering aspects.

KEY WORDS:

Solar Photovoltaic, Solar PV, Transport Study

QUALITY VERIFICATION

This report has been prepared under the controls established by a quality management system that meets the requirements of ISO 9001: 2015 which has been independently certified by DEKRA Certification.

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1 INTRODUCTION AND METHODOLOGY

1.1 Scope and Objectives

Sun Garden (Pty) Ltd is proposing the development of a commercial solar photovoltaic (PV) facility and associated infrastructure on a site located approximately 36km south-east of Somerset East and 28km south-west of Cookhouse within the Blue Crane Route Local Municipality and the Sarah Baartman District Municipality in the Eastern Cape Province, as shown in **Figure 1-1.**

The entire extent of the site falls within the Cookhouse Renewable Energy Development Zone (REDZ) and within the Eastern Corridor of the Strategic Transmission Corridors. The facility is known as the Sun Garden PV Facility.

A preferred project site with an extent of ~4 037ha has been identified by Sun Garden (Pty) Ltd as a technically suitable area for the development of the Sun Garden PV Facility.

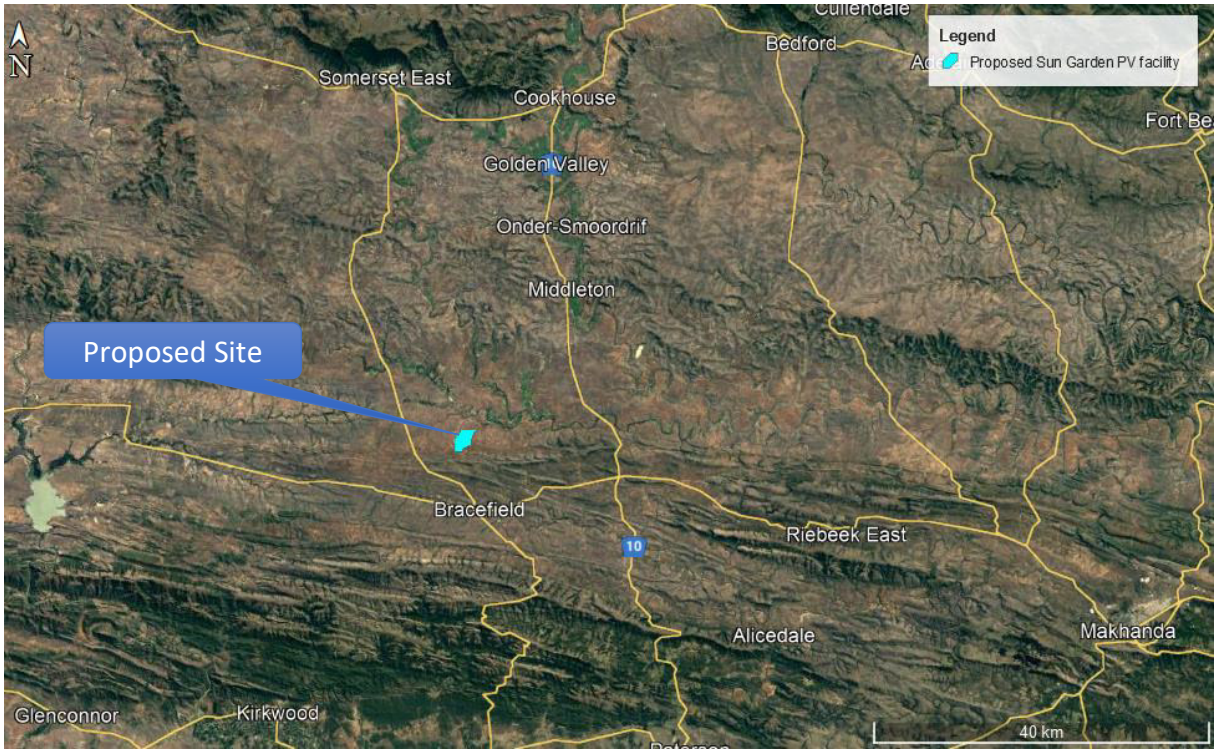

Figure 1-1: Aerial View of the Proposed Site

As part of the environmental impact process, the services of a Transportation Specialist are required to conduct the Transport Study for the proposed facility.

The following two main transportation activities will be investigated:

- Delivery of components to the site.
- The transportation of construction materials, equipment and people to and from the site/facility.

The transport study will aim to provide the following objectives:

- Recommend a preliminary route for the transportation of the components to the proposed site;
- Recommend a preliminary transportation route for the transportation of materials, equipment and people to site; and
- Recommend alternative or secondary routes where possible.

1.2 Terms of Reference

The Terms of Reference for this Transport Study include the following:

General:

- an indication of the methodology used in determining the significance of potential environmental impacts;
- a description of all environmental issues that were identified during the environmental impact assessment process;
- an assessment of the significance of direct, indirect and cumulative impacts in terms of the following criteria:
  - the *nature* of the impact, which shall include a description of what causes the effect, what will be affected and how it will be affected;
  - the *extent* of the impact, indicating whether the impact will be local (limited to the immediate area or site of development), regional, national or international;
  - the *duration* of the impact, indicating whether the lifetime of the impact will be of a short-term duration (0–5 years), medium-term (5–15 years), long-term (> 15 years, where the impact will cease after the operational life of the activity) or permanent;
  - the *probability* of the impact, describing the likelihood of the impact actually occurring, indicated as improbable (low likelihood), probable (distinct possibility), highly probable (most likely), or definite (impact will occur regardless of any preventative measures);
  - the *severity/beneficial scale*, indicating whether the impact will be very severe/beneficial (a permanent change which cannot be mitigated/permanent and significant benefit, with no real alternative to achieving this benefit), severe/beneficial (long-term impact that could be mitigated/long-term benefit), moderately severe/beneficial (medium- to long-term impact that could be mitigated/ medium- to long-term benefit), slight or have no effect;
  - the *significance*, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high;
  - the *status*, which will be described as either positive, negative or neutral;
  - the *degree* to which the impact can be reversed;
  - the *degree* to which the impact may cause irreplaceable loss of resources; and
  - the *degree* to which the impact can be *mitigated.*
- a description and comparative assessment of all alternatives identified during the environmental impact assessment process;
- recommendations regarding practical mitigation measures for potentially significant impacts, *for inclusion in the Environmental Management Programme (EMPr);*

- an indication of the extent to which the issue could be addressed by the adoption of mitigation measures;
- a description of any assumptions, uncertainties and gaps in knowledge;
- an environmental impact statement which contains:
  * a summary of the key findings of the environmental impact assessment; and
  * an assessment of the positive and negative implications of the proposed activity.

Specific:

- Extent of the transport study and study area;
- The proposed development;
- Trip generation for the facility during construction, operation and decommissioning;
- Traffic impact on external road network;
- Accessibility and turning requirements;
- National and local haulage routes;
- Assessment of internal roads and site access;
- Assessment of freight requirements and permitting needed for abnormal loads; and
- Traffic accommodation during construction.

1.3 Approach and Methodology

The report deals with the traffic impact on the surrounding road network in the vicinity of the site:

- during the construction of the access roads;
- construction of the solar PV facility;
- operation and maintenance during the operational phase; and
- the decommissioning phase.

This transport study was informed by the following:

Site Visit and Project Assessment

- Site visit to gain good understanding of the location;
- An initial meeting with the client;
- Overview of project background information including location maps, component specifications and any resulting abnormal loads to be transported; and
- Research of all available documentation and information relevant to the proposed facility.

The transport study considered and assessed the following:

Traffic and Haul Route Assessment

- Estimation of trip generation;
- Discussion on potential traffic impacts;
- Assessment of possible haul routes between port of entry / manufacturing location; and
- Construction, operational (maintenance) and decommissioning vehicle trips.

Site layout, Access Points and Internal Roads Assessment per Site

- Description of the surrounding road network;
- Description of site layout;
- Assessment of the possible access points onto the site; and

- Assessment of the proposed internal roads.

1.4 Assumptions and Limitations

The following assumptions and limitations apply:

- This study is based on the project information provided by the Client.
- According to the Eskom Specifications for Power Transformers (Eskom Power Series, Volume 5: Theory, Design, Maintenance and Life Management of Power Transformers), the following dimensional limitations need to be kept when transporting the transformer – total maximum height 5 000mm, total maximum width 4 300mm and total maximum length 10 500mm.
- Maximum vertical height clearances along the haulage route are 5.2m for abnormal loads.
- The imported elements will be transported from the most feasible port of entry, which is deemed to be Port of Ngqura in the Eastern Cape.
- If any elements are manufactured within South Africa, these will be transported from their respective manufacturing centers, which would be either in the greater Johannesburg, Cape Town or Pinetown/Durban.
- All haulage trips on the external road network will occur on either surfaced national and provincial roads or existing gravel roads.
- Material for the construction of internal access roads will be sourced locally as far as possible.

1.5 Source of Information

Information and software used in the transport study includes:

- Project Information provided by the Client;
- Google Earth.kmz provided by the Client;
- Google Earth Satellite Imagery;
- Road Traffic Act, 1996 (Act No. 93 of 1996)
- National Road Traffic Regulations, 2000
- SANS 10280/NRS 041-1:2008 - Overhead Power Lines for Conditions Prevailing in South Africa
- The Technical Recommendations for Highways (TRH 11): “Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads
- Information gathered during the site visit undertaken on 5 September 2019; and
- Project research of all available information.

2 DESCRIPTION OF PROJECT ASPECTS RELEVANT TO THE STUDY

2.1 Port of Entry

It is assumed that the solar PV components will be imported to South Africa via the Port of Ngqura in Coega, which is located near Port Elizabeth in the Eastern Cape. The Port of Ngqura is a world-class deep-water transshipment hub offering an integrated, efficient and competitive port service for containers on transit. The Port forms part of the Coega Special Economic Zone (CSEZ) and is operated by Transnet National Ports Authority.

2.2 Transportation requirements

It is anticipated that the following vehicles will access the site during construction:

- Conventional trucks within the freight limitations to transport building material to the site;
- 40ft container trucks transporting solar panels, frames and the inverter, which are within freight limitations;
- Flatbed trucks transporting the solar panels and frames, which are within the freight limitations;
- Light Differential Vehicle (LDV) type vehicles transporting workers from surrounding areas to site;
- Drilling machines and other required construction machinery being transported by conventional trucks or via self-drive to site; and
- The transformers will be transported as abnormal loads.

2.3 Abnormal Load Considerations

It is expected that the transformers will be transported with an abnormal load vehicle. Abnormal permits are required for vehicles exceeding the following permissible maximum dimensions on road freight transport in terms of the Road Traffic Act (Act No. 93 of 1996) and the National Road Traffic Regulations, 2000:

- Length: 22m for an interlink, 18.5m for truck and trailer and 13.5m for a single unit truck
- Width: 2.6m
- Height: 4.3m measured from the ground. Possible height of load – 2.7m.
- Weight: Gross vehicle mass of 56t resulting in a payload of approximately 30t
- Axle unit limitations: 18t for dual and 24t for triple-axle units
- Axle load limitation: 7.7t on the front axle and 9t on the single or rear axles

Any dimension / mass outside the above will be classified as an Abnormal Load and will necessitate an application to the Department of Transport and Public Works for a permit that will give authorisation for the conveyance of said load. A permit is required for each Province that the haulage route traverses.

2.4 Further Guideline Documentation

The Technical Recommendations for Highways (TRH 11): “Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads” outlines the rules and conditions that apply to the transport of abnormal loads and vehicles on public roads and the detailed procedures to be followed in applying for exemption permits are described and discussed. Legal axle load limits and the restrictions imposed on abnormally heavy loads are discussed in relation to the damaging effect on road pavements, bridges and culverts.

The general conditions, limitations and escort requirements for abnormally dimensioned loads and vehicles are also discussed and reference is made to speed restrictions, power / mass ratio, mass distribution and general operating conditions for abnormal loads and vehicles. Provision is also made for the granting of permits for all other exemptions from the requirements of the Road Traffic Act and the relevant regulations.

2.5 Permitting – General Rules

The limits recommended in TRH 11 are intended to serve as a guide to the Permit Issuing Authorities. It must be noted that each Administration has the right to refuse a permit application or to modify the conditions under which a permit is granted. It is understood that:

a) A permit is issued at the sole discretion of the Issuing Authority. The permit may be refused because of the condition of the road, the culverts and bridges, the nature of other traffic on the road, abnormally heavy traffic during certain periods or for any other reason.
b) A permit can be withdrawn if the vehicle upon inspection is found in any way not fit to be operated.
c) During certain periods, such as school holidays or long weekends an embargo may be placed on the issuing or permits. Embargo lists are compiled annually and are obtainable from the Issuing Authorities.

2.6 Load Limitations

The maximum load that a road vehicle or combination of vehicles will be allowed to carry legally under permit on a public road is limited by:

- the capacity of the vehicles as rated by the manufacturer;
- the load which may be carried by the tyres;
- the damaging effect on pavements;
- the structural capacity on bridges and culverts;
- the power of the prime mover(s);
- the load imposed by the driving axles; and
- the load imposed by the steering axles.

2.7 Dimensional Limitations

A load of abnormal dimensions may cause an obstruction and danger to other traffic. For this reason, all loads must, as far as possible, conform to the legal dimensions. Permits will only be considered for indivisible loads, i.e. loads that cannot, without disproportionate effort, expense or risk of damage, be divided into two or more loads for the purpose of transport on public roads. For each of the characteristics below there is a legally permissible limit and what is allowed under permit:

- Width;
- Height;
- Length;
- Front Overhang;
- Rear Overhang;
- Front Load Projection;

- Rear Load Projection;
- Wheelbase;
- Turning Radius; and
- Stability of Loaded Vehicles.

2.8 Transporting Other Plant, Material and Equipment

In addition to transporting the specialised equipment, the normal Civil Engineering construction materials, plant and equipment will need to be transported to the site (e.g. sand, stone, cement, gravel, water, compaction equipment, concrete mixers, etc.). Other components, such as electrical cables, pylons and substation transformers, will also be transported to site during construction. The transport of these items will generally be conducted with normal heavy loads vehicles, except for the transformers which require an abnormal load vehicle.

3 DESCRIPTION OF THE AFFECTED ENVIRONMENT

3.1 Description of the site

The proposed Sun Garden PV Facility will be located south of Somerset East and Cookhouse in the Eastern Cape. The proposed site is bounded by the R335 to the west, the N10 to the east and the R400 to the south, as shown in **Figure 3-1**.

The project site consists of four affected properties:

- Portion 9 of the farm Britzkraal No 253, Division of Somerset East
- Portion 8 (a Portion of Portion 7) of the farm Britzkraal No 253, Division of Somerset East
- Portion 7 of the Farm Britzkraal No 253, Division of Somerset East
- Portion 1 of the Farm Bothas Hoop 358

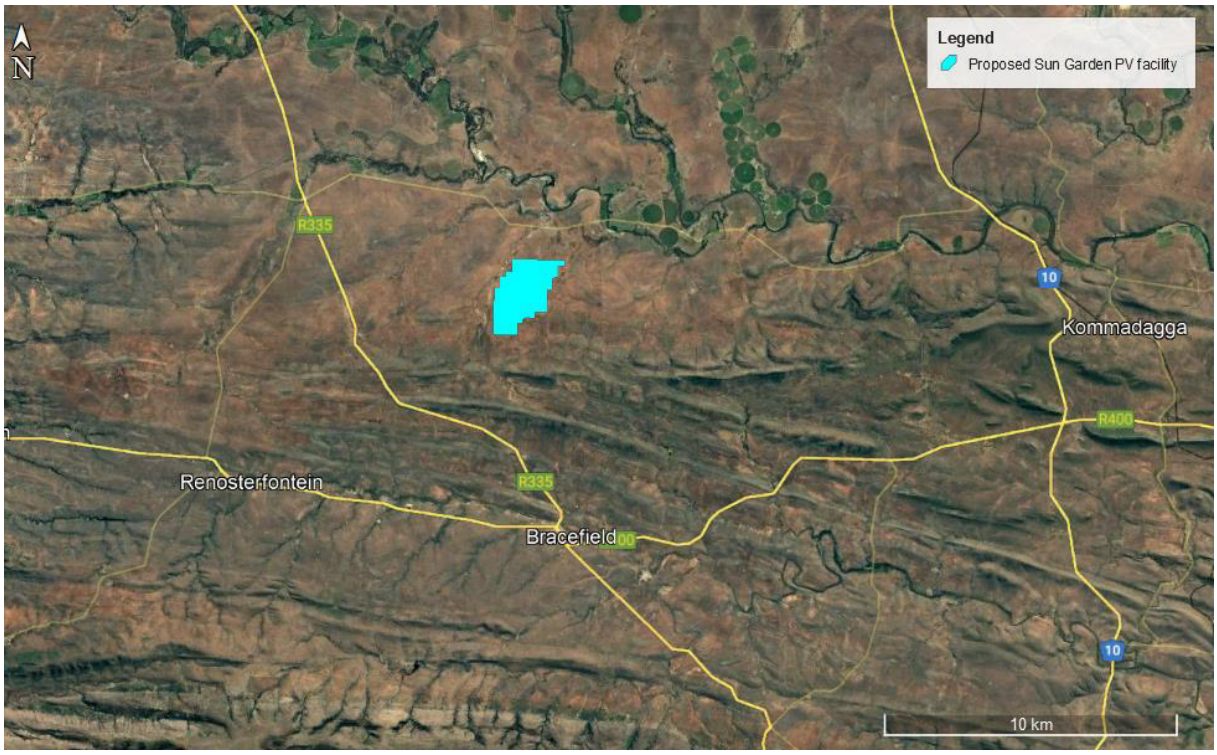

Figure 3-1: Aerial View of Proposed Sun Garden PV Facility

The development footprint will contain the following infrastructure to enable the solar facility to generate up to 400MW:

- Solar PV array comprising PV modules and mounting structures.
- Inverters and transformers.
- Cabling between the project components, lain underground where practical.
- A 132/33kV on-site collector substation to be connected to a proposed 400kV Main Transmission Substation (MTS) located to the south of the site via a new 132kV overhead power line (twin turn dual circuit line). The development of the proposed 400kV Main Transmission Substation will be assessed as part of the separate BA process in order to obtain Environmental Authorisation.

- Site offices and maintenance buildings, including workshop areas for maintenance and storage.
- Water supply pipelines from the onsite boreholes.
- Temporary laydown areas.
- Access roads to the site and between project components with a width of approximately 4,5m. The main access points will be 8m wide.
- A temporary concrete batching plant.
- Staff accommodation (temporary).
- Operation and Maintenance buildings including a gate house, security building, control centre, offices, warehouses, a workshop and visitor's centre.

The new 132kV overhead power line to connect the facility to the proposed 400kV Main Transmission Substation will follow a route east of the project site to complete the connection. The power line will therefore cross properties located to the south of the project site. The majority of these properties form part of the project sites of the adjacent proposed wind farms which forms part of the cluster of renewable energy facilities proposed. The power line is being assessed within a 300m grid connection corridor which will provide for the avoidance of sensitive environment areas and features and allow for the micro-siting of the power line within the corridor.

A development envelope for the placement of the solar facility infrastructure (i.e. development footprint) has been identified within the project site and assessed as part of the BA process. The development envelope is ~500ha in extent and the much smaller development footprint of ~350ha will be placed and sited within the development envelope.

3.2 National Route to Site for Imported Components

The preferred route from the Port of Ngqura is shown in green in **Figure 3-3** below. The Port of Ngqura is located approximately 130km travel distance from the proposed Sun Garden PV Facility.

The preferred route for the abnormal load vehicles will be from the Port, heading east on the N10 past Nanaga towards Kommadagga. Vehicle will turn left onto the road to Beenleegte, which leads to the access to the proposed site.

Should the Port of Ngqura not be available at the time of construction, the Port of Saldanha (shown in orange in **Figure 3-3)** and the Port of Richards Bay (shown in blue) could be considered as alternatives. The Port of Saldanha is located approximately 920km from the proposed site and the Port of Richards Bay is located approximately 1 100km travel distance from the proposed site.

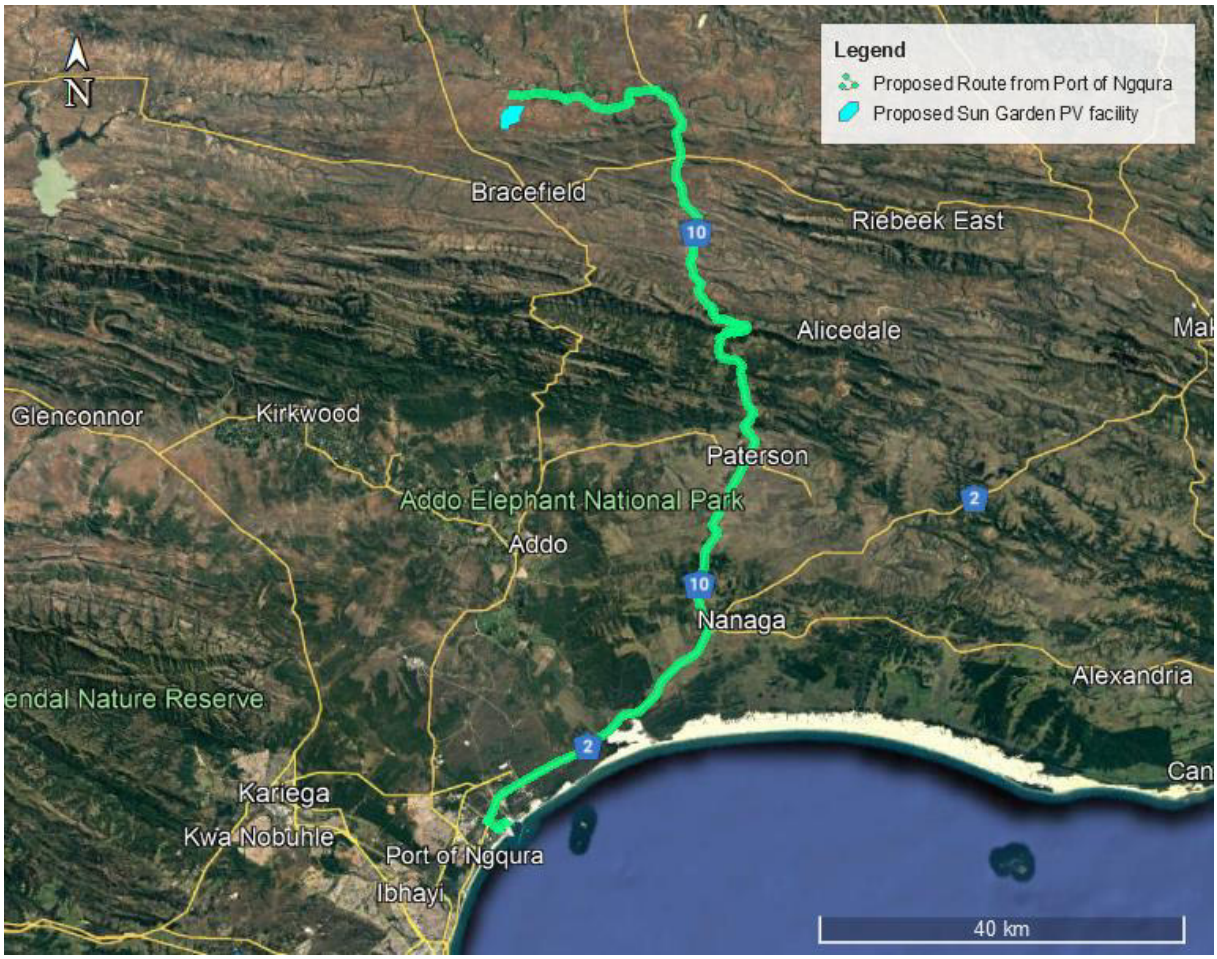

Figure 3-2: Preferred route from the Port of Ngqura

Figure 3-3: Routes from the Ports

It is critical to ensure that the abnormal load vehicle will be able to move safely and without obstruction along the preferred route. The preferred route should be surveyed prior to construction to identify any problem areas, e.g. intersections with limited turning radii and sections of the road with sharp horizontal curves or steep gradients, that may require modification. After the road modifications have been implemented, it is recommended to undertake a "dry-run" with the largest abnormal load vehicle, prior to the transportation of any components, to ensure that the delivery will occur without disruptions.

It needs to be ensured that the gravel sections of the haulage routes remain in good condition and will need to be maintained during the additional loading of the construction phase and reinstated after construction is completed.

3.3 Route for Components manufactured locally

As mentioned in Section 1.4 (Assumptions and Limitations), it is anticipated that elements manufactured within South Africa will be transported to the site from the Cape Town, Johannesburg and Pinetown/Durban areas. It is also assumed that the transformer, which will be transported with an abnormal load vehicle, will be transported from the Johannesburg area and therefore it needs to be verified that the route from the manufacturer to the site does not have any load limitations for abnormal vehicles. At this stage, only a high-level assessment can be undertaken as no information of the exact location of the manufacturer is known and all road structures (such as bridges and culverts) need to be confirmed for their load bearing by SANRAL or the respective Roads Authority.

3.4 Route from Cape Town to Proposed Site

Components, such as PV panels, manufactured in Cape Town will be transported to site via road as shown in **Figure 3-4**. Haulage vehicles will travel from Cape Town on the N1 to the proposed site, passing Laingsburg and Beaufort West. Vehicles will continue on the R61 to Aberdeen and the N9 to Graaf-Reinet, before taking the R63 to Somerset East. Vehicle will then travel south on the R335 before accessing the access road to the proposed site.

Haulage vehicles will mainly travel on the national and provincial roads and the total distance to the proposed site is approximately 840km.

Figure 3-4: Route from Cape Town to Proposed Site

3.5 Route from Johannesburg to Proposed Site

It is assumed that the inverter and support structure will be manufactured in the Johannesburg area and transported to site via the N1, R390 and the N10. The travel distance is around 640km and no road limitations are expected on this route for normal loads vehicles as it will mainly follow national and provincial roads. The route is shown in **Figure 3-5**.

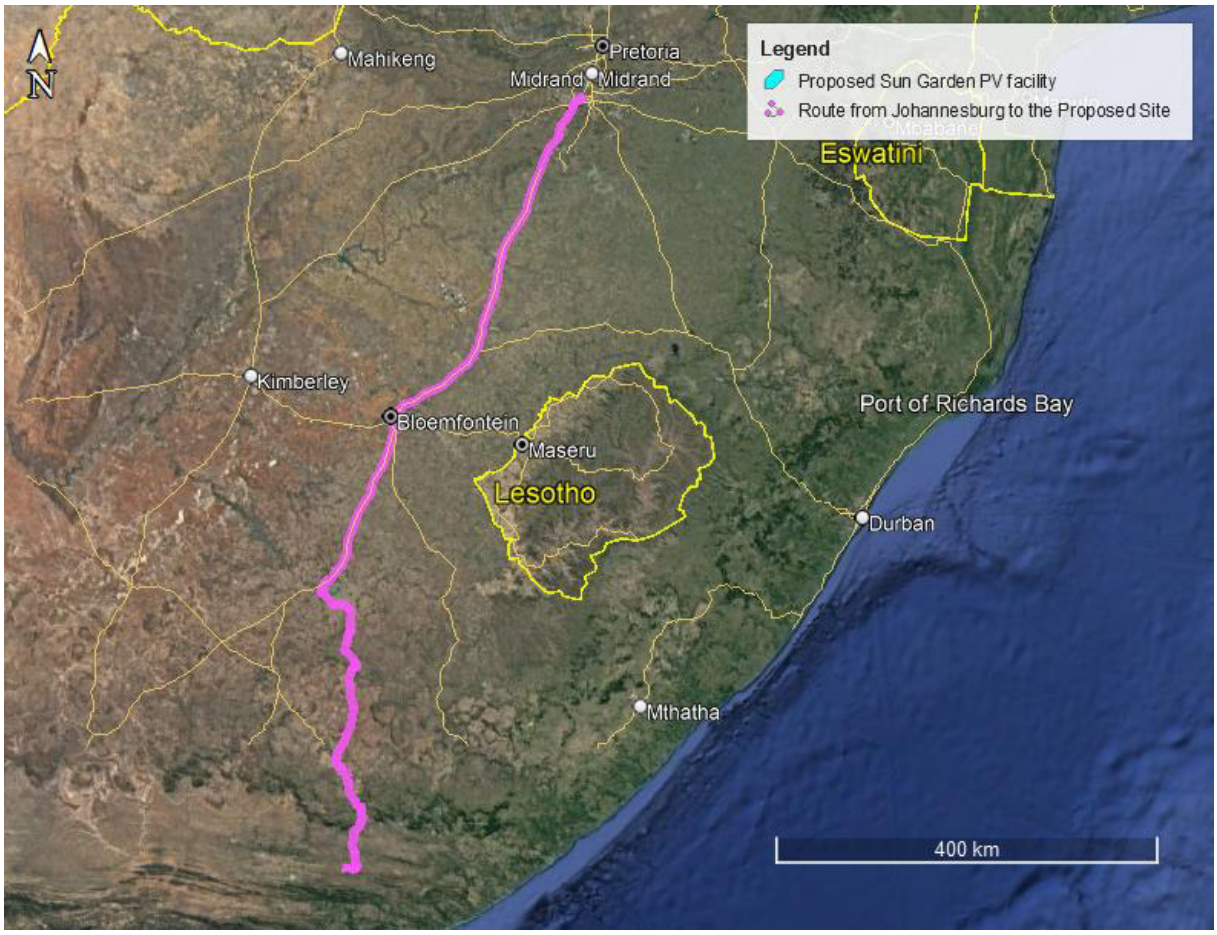

Figure 3-5: Route from Johannesburg to Proposed Site

3.6 Route from Pinetown / Durban to Proposed Site

If the PV panels are manufactured in South Africa, they could possibly be manufactured in the Pinetown area, close to Durban and transported to site via road. These elements are normal loads, and no road limitations are expected along the routes, which is shown in **Figure 3-6**. Haulage vehicles will mainly travel on national and provincial roads and the total distance to the proposed site is approximately 890km.

Figure 3-6: Route from Durban to Proposed Site

3.7 Route from Johannesburg Area to Site – Abnormal Load

It is assumed that the transformer will be manufactured locally in South Africa and be transported from the Johannesburg area to site. As the transformer will be transported with an abnormal load vehicle, the route planning needs a more detailed investigation of the feasible routes considering any limitations due to existing road features. Furthermore, a load of abnormal dimensions may cause an obstruction and danger to other traffic and therefore the transformer needs to be transported as far as possible on roads that are wide enough for general traffic to pass. It is expected that the transformer can be transported to site via the same route used for normal loads.

There are several bridges and culverts along this route, which need to be confirmed for load bearing and height clearances. There are several turns along the way and small towns to pass through. According to the desktop study, all turning movements along the route are manageable for the abnormal vehicle.

However, there are many alternative routes which can be investigated if the above route or sections of the route should not be feasible.

3.8 Proposed main access road and access point to the Proposed Development

The proposed main access road to the site is an existing gravel road between the N10 and R335, as shown in **Figure 3-7**. The proposed access road will link to the internal road network of the facility.

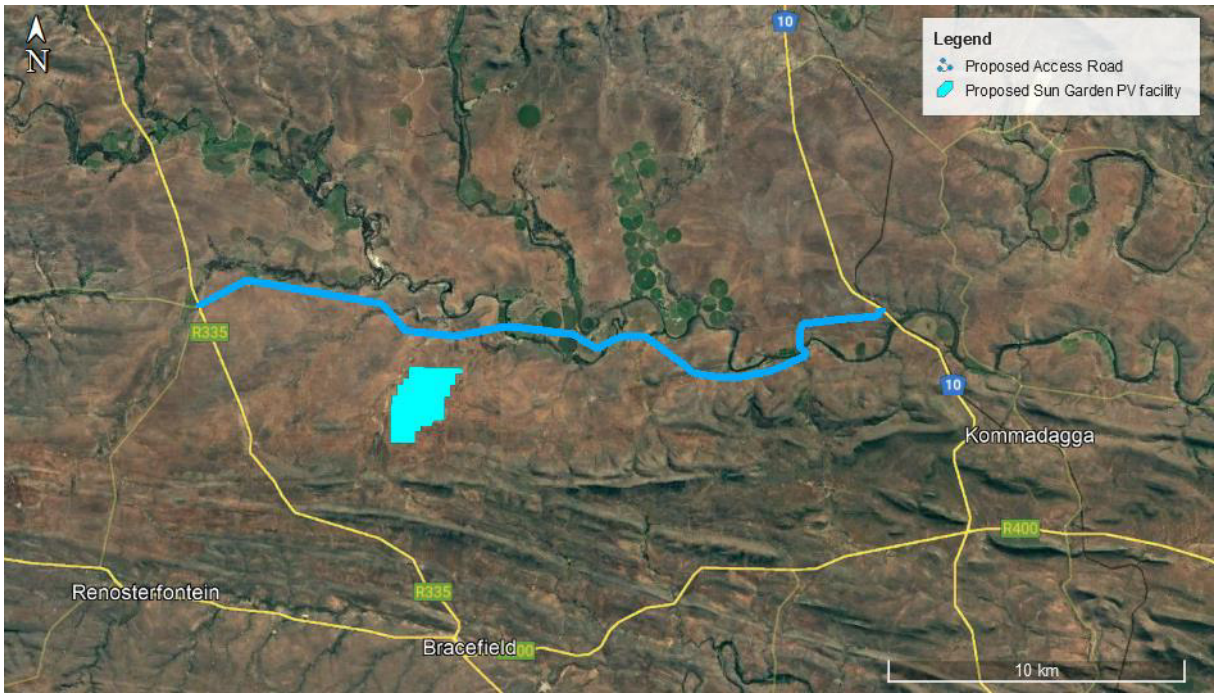

Figure 3-7: Proposed Access Road

The proposed access point to the site will be located on the main access road, as shown in **Figure 3-8**.

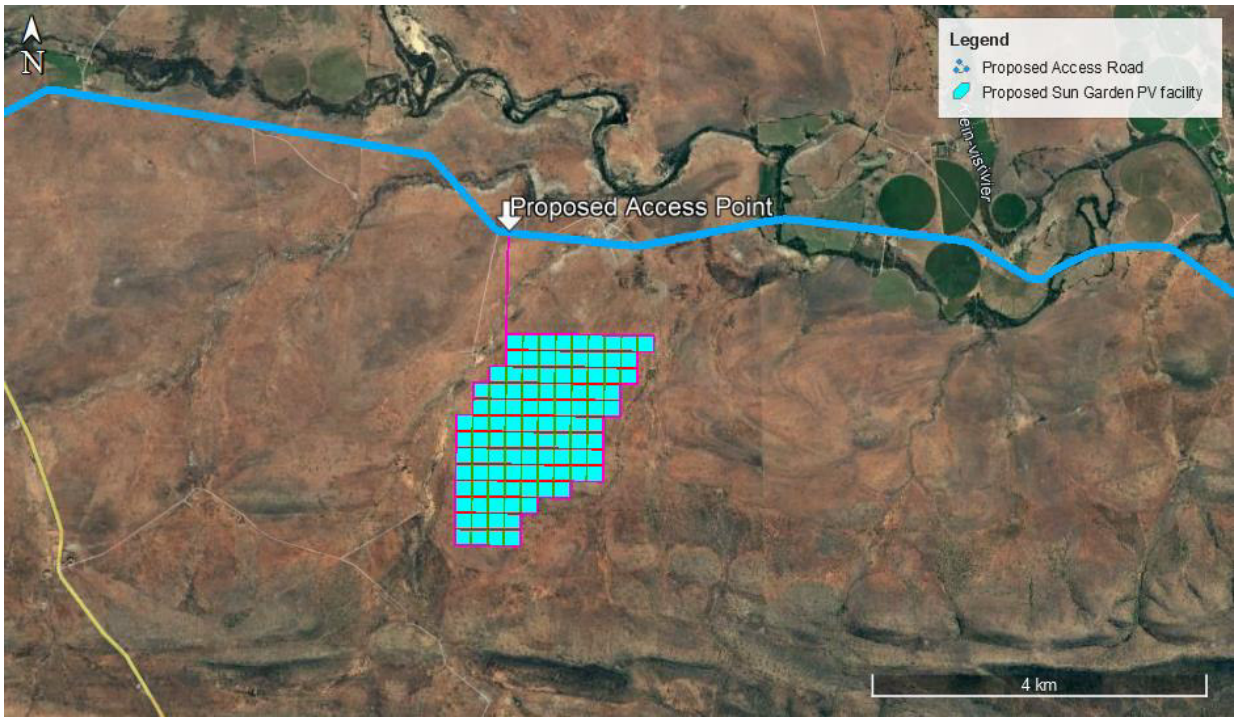

Figure 3-8: Proposed Access Point

The **proposed access road and the access point to the development is deemed suitable** from a traffic engineering perspective.

A minimum required road width of 4 m needs to be maintained and all turning radii must conform with the specifications needed for the abnormal load vehicles and haulage vehicles. It needs to be ensured that the gravel sections of the haulage routes remain in good condition and will hence need to be maintained during the additional loading of the construction phase and then reinstated after construction is completed. The gravel roads will require grading with a grader to obtain a flat even surface and the geometric design of these gravel roads needs to be confirmed at detailed design stage.

3.9 Main Route for the Transportation of Materials, Plant and People to the proposed site

The nearest towns in relation to the proposed development site are Somerset East, Cookhouse Kirkwood and Addo. It is envisaged that most materials, water, plant, services and people will be procured within a 50km radius of the proposed facility. The nearest major town, Makhanda (Grahamstown), is located approximately 80km from the proposed development site.

Concrete batch plants and quarries in the vicinity could be contracted to supply materials and concrete during the construction phase, which would reduce the impact on traffic on the surrounding road network. Alternatively, mobile concrete batch plants and temporary construction material stockpile yards could be commissioned on vacant land near the proposed site. Delivery of materials to the mobile batch plant and the stockpile yard could be staggered to minimise traffic disruptions.

It is envisaged that most materials, water, plant, services and people will be procured within a 100km radius from the proposed site.

4 APPLICABLE LEGISLATION AND PERMIT REQUIREMENTS

Key legal requirements pertaining to the transport requirements for the proposed solar PV facility are:

- Abnormal load permits, (Section 81 of the National Road Traffic Act 93 of 1996 and National Road Traffic Regulations, 2000);
- Port permit (Guidelines for Agreements, Licenses and Permits in terms of the National Ports Act No. 12 of 2005), and
- Authorisation from Road Authorities to modify the road reserve to accommodate turning movements of abnormal loads at intersections.

5 IDENTIFICATION OF KEY ISSUES

5.1 Identification of Potential Impacts

The potential transport related impacts are described below.

5.1.1 Construction Phase

Potential impact

- Construction related traffic
- The construction traffic would also lead to noise and dust pollution.
- This phase also includes the construction of roads, excavations, trenching and ancillary construction works that will temporarily generate the most traffic.

5.1.2 Operational Phase

During operation, it is expected that staff and security will visit the facility. Approximately twenty (20) full-time employees[1] will be stationed on site. The traffic generated during this phase will be minimal and will not have an impact on the surrounding road network.

5.1.3 Decommissioning Phase

This phase will result in the same impact as the Construction Phase as similar trips are expected.

5.1.4 Cumulative Impacts

- Traffic congestion/delays on the surrounding road network.
- Noise and dust pollution

[1] Subject to change. However, based on experience with similar projects, the number of full-time employees is generally low and consequently, the associated trips are negligible.

6 ASSESSMENT OF IMPACTS AND IDENTIFICATION OF MANAGEMENT ACTIONS

6.1 Potential Impact (Construction Phase)

6.1.1 Nature of the impact

- Potential traffic congestion and delays on the surrounding road network and associated noise, dust and exhaust pollution.

6.1.2 Significance of impact without mitigation measures

- Traffic generated by the construction of the facility will have a significant impact on the surrounding road network. The exact number of trips generated during construction will be determined by the contractor, the haulage company transporting the components to site, the staff requirements and where equipment is sourced from.

6.1.3 Trip Generation – Construction Phase

From experience on other projects of similar nature, the number of heavy vehicles per 7MW installation is estimated to range between 200 and 300 trips depending on the site conditions and requirements. For the 400MW, the total trips can therefore be estimated to be between 11 429 and 17 143 heavy vehicle trips, which will generally be made over a 12-month construction period. Choosing the worst-case scenario of 17 143 heavy vehicles over a 12-month period travelling on an average of 22 working days per month, the resulting daily number of vehicle trips is 65. Considering that the number of vehicle trips during peak hour traffic in a rural environment can roughly be estimated at around 20-40% of the average daily traffic, the resulting vehicle trips for the construction phase are approximately 13 - 26 trips.

If the panels are imported instead of manufactured within South Africa, the respective shipping company will be able to indicate how the panels can be packed (for example using 2MW packages and 40ft containers). These can then be stored at the port and repacked onto flatbed trucks.

It is assumed that during the peak of the construction period, 200 employees will be active on site. Staff trips are assumed to be:

Table 6-1: Estimation of daily staff trips

Vehicle Type	Number of vehicles	Number of Employees
Car	10	15 (assuming 1.5 occupants)
Bakkie	20	30 (assuming 1.5 occupants)
Taxi – 15 seats	5	75
Bus – 80 seats	1	80
Total	**36**	**200**

It is difficult to accurately estimate the construction traffic for the transportation of materials as it depends on the type of vehicles, tempo of the construction, source/location of construction material etc. However, it is assumed that at the peak of construction, approximately 150 construction vehicle trips will access the site per day.

The total estimated daily site trips are shown in the table below.

Table 6-2: Estimation of daily site trips

Activity	Number of trips
Staff trips	36
Component delivery	65
Construction trips	150
Total	**251**

The impact on the surrounding road network and the general traffic is therefore deemed nominal as the 251 trips will be distributed across a 9-hour working day. The majority of the trips will occur outside the peak hours.

The significance of the transport impact without mitigation measures during the construction phase can be rated as medium. However, considering that this is temporary and short term in nature, the impact can be mitigated to an acceptable level.

6.1.4 Trip Generation – Operational Phase

During operation, it is assumed that approximately twenty (20) full-time employees will be stationed on site and hence vehicle trips generated are low and will have a negligible impact on the external road network.

The developer is investigating the use of borehole water for the cleaning of the PV panels. Should borehole water not be available or suitable, the following assumptions have been made to estimate the resulting trips generated from transporting water to the site:

- 5 000 litre water bowsers to be used for transporting the water
- Approximately 5 litres of water needed per panel per annum
- Assuming that 750 000 solar panels are used, this would amount to approximately 750 vehicle trips
- Panels will be cleaned four times a year.

It is expected that these trips will not have a significant impact on external traffic. However, to limit the impact, it is recommended to schedule these trips outside of peak traffic periods and to spread the trips over a few days.

Additionally, the provision of rainwater tanks on site would decrease the number of trips.

6.1.5 Proposed general mitigation measures

The following are general mitigation measures to reduce the impact that the additional traffic will have on the road network and the environment.

- The delivery of components to the site can be staggered and trips can be scheduled to occur outside of peak traffic periods.
- Dust suppression of gravel roads during the construction phase, as required.
- Regular maintenance of gravel roads by the Contractor during the construction phase and by the Owner/Facility Manager during the operation phase.

- The use of mobile batch plants and quarries near the site would decrease the traffic impact on the surrounding road network.
- Staff and general trips should occur outside of peak traffic periods as far as possible.
- The Contractor is to ensure that drivers transporting staff adhere to the traffic laws. Vehicular movements within the site boundary are the responsibility of the respective Contractor and the Contractor must ensure that all construction road traffic signs and road markings (where applicable) are in place. It should be noted that traffic violations on public roads is the responsibility of Law Enforcement and the public should report all transgressions to Law Enforcement and the Contractor.
- If required, low hanging overhead lines (lower than 5.1m) e.g. Eskom and Telkom lines, along the proposed routes will have to be moved to accommodate the abnormal load vehicles.
- The preferred route should be surveyed to identify problem areas (e.g. intersections with limited turning radii and sections of the road with sharp horizontal curves or steep gradients, that may require modification). After the road modifications have been implemented, it is recommended to undertake a "dry-run" with the largest abnormal load vehicle, prior to the transportation of any components, to ensure that delivery will occur without disruptions. This process is to be undertaken by the haulage company transporting the components and the contractor, who will modify the road and intersections to accommodate abnormal vehicles. It needs to be ensured that the gravel sections of the haulage routes remain in good condition and will need to be maintained during the additional loading of the construction phase and reinstated after construction is completed.
- Design and maintenance of internal roads. The internal gravel roads will require grading with a grader to obtain a flat even surface and the geometric design of these gravel roads needs to be confirmed at detailed design stage. This process is to be undertaken by a civil engineering consultant or a geometric design professional.

6.1.6 Significance of impact with mitigation measures

The proposed mitigation measures for the construction traffic will result in a minor reduction of the impact on the surrounding road network, but the impact on the local traffic will remain moderate as the existing traffic volumes are deemed to be low. The dust suppression, however, will result in significantly reducing the impact.

7 NO-GO ALTERNATIVE

The no-go alternative implies that the proposed development of the Sun Garden PV Facility does not proceed. This would mean that there will be no negative environmental impacts and no traffic impact on the surrounding network during the construction and decommissioning phases of the proposed Sun Garden PV Facility. However, this would also mean that there would be no socio-economic benefits to the surrounding communities, and it will not assist government in meeting its targets for renewable energy. **Hence, the no-go alternative is not a preferred alternative.**

8 IMPACT ASSESSMENT SUMMARY

The assessment of impacts and recommendation of mitigation measures as discussed above are collated in the tables below. The assessment methodology is attached as **Annexure A.**

Table 8-1: Impact Rating - Construction Phase – Traffic Congestion

Nature: **Traffic congestion due to an increase in traffic caused by the transportation of equipment, material and staff to site**		
	Without mitigation	**With mitigation**
Extent	Local (2)	Local (1)
Duration	Short (2)	Short (2)
Magnitude	Moderate (6)	Low (4)
Probability	Definite (5)	Probable (3)
Significance	**Medium (50)**	**Low (21)**
Status (positive or negative)	Negative	Negative
Reversibility	Completely reversible	Completely reversible
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: ▪ *Stagger component delivery to site* ▪ *Reduce the construction period* ▪ *The use of mobile batching plants and quarries in close proximity to the site* ▪ *Staff and general trips should occur outside of peak traffic periods.* ▪ *Regular maintenance of gravel roads by the Contractor during the construction phase.*		
Residual Impacts: *The proposed mitigation measures for the construction traffic will result in a reduction of the impact on the surrounding road network. Traffic will return to normal levels after construction is completed.*		

Table 8-2: Impact Rating - Construction Phase – Dust Pollution

Nature: **Construction traffic on roads will generate dust. Air quality will be affected by dust pollution**		
	Without mitigation	**With mitigation**
Extent	Local (1)	Local (1)
Duration	Short (2)	Short (2)
Magnitude	Moderate (6)	Low (4)
Probability	Highly probable (4)	Probable (3)
Significance	**Medium (36)**	**Low (21)**
Status (positive or negative)	Negative	Negative
Reversibility	Completely reversible	Completely reversible
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: ▪ *Dust Suppression of gravel roads during the construction phase, as required.* ▪ *Regular maintenance of gravel roads by the Contractor during the construction phase.*		
Residual Impacts: *Dust pollution during the construction phase cannot be completely mitigated but mitigation measures will significantly reduce the impact. Dust pollution is limited to the construction period.*		

Table 8-3: Impact Rating - Construction Phase – Noise Pollution

Nature: **Construction traffic on roads will generate noise i.e. Noise pollution due to increased traffic**		
	Without mitigation	**With mitigation**
Extent	Local (2)	Local (1)
Duration	Short (2)	Short (2)
Magnitude	Moderate (6)	Low (4)
Probability	Highly probable (4)	Probable (3)
Significance	**Medium (40)**	**Low (21)**
Status (positive or negative)	Negative	Negative
Reversibility	Completely reversible	Completely reversible
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: ▪ *Stagger component delivery to site* ▪ *Reduce the construction period* ▪ *The use of mobile batching plants and quarries in close proximity to the site* ▪ *Staff and general trips should occur outside of peak traffic periods*		
Residual Impacts: *Noise pollution during the construction phase cannot be completely mitigated but mitigation measures will significantly reduce the impact. Noise pollution is limited to the construction period.*		

Table 8-4: Impact Rating - Operation Phase

IMPACT TABLE – OPERATION PHASE
The traffic generated during this phase will be negligible and will not have a significant impact on the surrounding road network. However, the Client/Facility Manager is to ensure that regular maintenance of gravel roads occurs during operation phase to minimise/mitigate dust pollution.

Table 8-5: Impact Rating - Decommissioning Phase

IMPACT TABLE – DECOMMISSIONING PHASE
This phase will have the same impact as the Construction Phase i.e. traffic congestion, air pollution and noise pollution, as similar trips/movements are expected.

9 CUMULATIVE IMPACTS

To assess the cumulative impact, it was assumed that all proposed and authorized renewable energy projects within 50 km be constructed at the same time. This is a precautionary approach, as in reality these projects would be subject to a highly competitive bidding process. Only a handful of projects would be selected to enter into a power purchase agreement with Eskom, and construction is likely to be staggered depending on project-specific issues.

The construction and decommissioning phases are the only significant traffic generators for renewable energy projects. The duration of these phases is short term (i.e. the impact of the generated traffic on the surrounding road network is temporary and renewable energy facilities, when operational, do not add any significant traffic to the road network). Even if all renewable energy projects within the area are constructed at the same time, the roads authority will consider all applications for abnormal loads and work with all project companies to ensure that loads on the public roads are staggered and staged to ensure that the impact will be acceptable.

The assessments of cumulative impacts are collated in the table below.

Table 9-1: Cumulative Impact

Nature: **Traffic congestion and the associated noise and dust pollution.**		
	Overall impact of the proposed project considered in isolation	***Cumulative impact of the project and other projects in the area***
Extent	Local (1)	Regional (3)
Duration	Short (2)	Short (2)
Magnitude	Low (4)	High (8)
Probability	Probable (3)	Improbable (2)
Significance	**Low (21)**	**Low (26)**
Status (positive or negative)	Negative	Negative
Reversibility	Completely reversible	Reversible, with slight increase in operational traffic
Irreplaceable loss of resources?	No	No
Can impacts be mitigated?	Yes	
Mitigation: ▪ *Stagger component delivery to site* ▪ *Dust suppression* ▪ *Reduce the construction period* ▪ *The use of mobile batching plants and quarries in close proximity to the site* ▪ *Staff and general trips should occur outside of peak traffic periods*		
Residual Impacts: *The increase in traffic cannot be completely mitigated but mitigation measures will significantly reduce the impact. Noise and dust pollution are limited to the construction and decommissioning periods.*		

10 ENVIRONMENTAL MANAGEMENT PROGRAM INPUTS

It is recommended that dust suppression and maintenance of gravel roads form part of the EMPr. This would be required during the Construction phase where an increase in vehicle trips can be expected.

Table 10-1: EMPr Input

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
A. CONSTRUCTION PHASE					
A.1. TRAFFIC IMPACTS					
Increase in traffic will lead to dust and noise pollution.	Minimize impacts on road network and surrounding area.	▪ Stagger component delivery to site. ▪ The use of mobile batching plants and quarries near the site would decrease the impact on the surrounding road network. ▪ Dust suppression ▪ Reduce the construction period as far as possible. ▪ Maintenance of gravel roads.	▪ Regular monitoring of road surface quality. ▪ Apply for required permits prior to commencement of construction.	▪ Before construction commences and regularly during construction phase.	▪ EPC and/or Contractor

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		▪ Apply for abnormal load permits prior to commencement of delivery via abnormal loads. ▪ Assess the preferred route and undertake a 'dry run' to test. ▪ Staff and general trips should occur outside of peak traffic periods as far as possible. ▪ The Contractor is to ensure that drivers transporting staff adhere to the traffic laws. ▪ Vehicular movements within the site boundary are the responsibility of the respective Contractor and the Contractor must ensure			

Impact	Mitigation/Management Objectives	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		that all construction road traffic signs and road markings (where applicable) are in place. It should be noted that traffic violations on public roads is the responsibility of Law Enforcement and the public should report all transgressions to Law Enforcement and the Contractor. ▪ Any low hanging overhead lines (lower than 5.1m) e.g. Eskom and Telkom lines, along the proposed routes will have to be moved to accommodate the abnormal load vehicles, if required.			

B. OPERATIONAL PHASE					
B.1. MAINTENANCE OF GRAVEL ROADS					
Dust pollution and road deterioration	Minimize impacts on road network and surrounding area.	▪ Dust suppression ▪ Maintenance of gravel roads.	▪ Regular monitoring of road surface quality.	▪ Regularly during operational phase.	▪ Client/Facility Manager

11 CONCLUSION AND RECOMMENDATIONS

The potential traffic and transport related impacts for the construction, operation and decommissioning phases of the proposed Sun Garden PV Facility were identified and assessed.

- The main impact on the external road network will be during the construction phase. This phase is temporary in comparison to the operational period. The number of abnormal loads vehicles was estimated and to be found to be able to be accommodated by the road network.
- During operation, it is expected that maintenance and security staff will periodically visit the facility. It is assumed that approximately twenty (20) full-time employees will be stationed on site. The traffic generated during this phase will be minimal and will not have an impact on the surrounding road network.
- The traffic generated during the construction phase, although significant, will be temporary and impacts are considered to be negative and of medium significance before and of **low significance** after mitigation.
- The traffic generated during the decommissioning phase will be less than the construction phase traffic and the impact on the surrounding road network will also be considered negative and of medium significance before and of **low significance** after mitigation.

The potential mitigation measures mentioned in the construction and decommissioning phases are:

- Dust suppression
- Component delivery to/ removal from the site can be staggered and trips can be scheduled to occur outside of peak traffic periods.
- The use of mobile batching plants and quarries near the site would decrease the impact on the surrounding road network.
- Staff and general trips should occur outside of peak traffic periods.
- A “dry run” of the preferred route.
- Design and maintenance of internal roads.
- Any low hanging overhead lines (lower than 5.1m) e.g. Eskom and Telkom lines, along the proposed routes will have to be moved or raised to accommodate the abnormal load vehicles.

The construction and decommissioning phases of a solar PV facility are the only significant traffic generators and therefore noise and dust pollution will be higher during these phases. The duration of these phases is short term i.e. the impact of the solar PV facility on the traffic on the surrounding road network is temporary and solar facilities, when operational, do not add any significant traffic to the road network.

The access road and access point to the proposed site have been assessed and were found to be acceptable from a traffic engineering perspective.

The development is supported from a transport perspective provided that the recommendations and mitigations contained in this report are adhered to.

The potential impacts associated with proposed Sun Garden PV Facility and associated infrastructure are acceptable from a transport perspective and it is therefore recommended that the proposed facility be authorised.

12 REFERENCES

- Google Earth Pro
- SANS 10280/NRS 041-1:2008 - Overhead Power Lines for Conditions Prevailing in South Africa
- Road Traffic Act (Act No. 93 of 1996)
- National Road Traffic Regulations, 2000
- The Technical Recommendations for Highways (TRH 11): “Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads

13 ANNEXURES

Annexure A – ASSESSMENT METHODOLOGY

Assessment of Impacts

Direct, indirect and cumulative impacts associated with the projects must be assessed in terms of the following criteria:

- The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high):
- The **duration**, wherein it will be indicated whether:
  - the lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
  - the lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
  - medium-term (5–15 years) – assigned a score of 3;
  - long term (> 15 years) - assigned a score of 4; or
  - permanent - assigned a score of 5;
- The **magnitude**, quantified on a scale from 0-10, where 0 is small and will have no effect on the environment, 2 is minor and will not result in an impact on processes, 4 is low and will cause a slight impact on processes, 6 is moderate and will result in processes continuing but in a modified way, 8 is high (processes are altered to the extent that they temporarily cease), and 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The **probability** *of occurrence*, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1–5, where 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).
- the **significance**, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and
- the **status**, which will be described as either positive, negative or neutral.
- the degree to which the impact can be reversed.
- the degree to which the impact may cause irreplaceable loss of resources.
- the *degree* to which the impact can be *mitigated.*

The **significance** is calculated by combining the criteria in the following formula:

$$S=(E+D+M)P$$

S = Significance weighting
E = Extent
D = Duration
M = Magnitude
P = Probability

The **significance weightings** for each potential impact are as follows:

- < 30 points: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- 30-60 points: Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- > 60 points: High (i.e. where the impact must have an influence on the decision process to develop in the area).

Assessment of impacts must be summarised in the following table format. The rating values as per the above criteria must also be included.

Example of Impact table summarising the significance of impacts (with and without mitigation)

Nature: **[Outline and describe fully the impact anticipated as per the assessment undertaken]**		
	Without mitigation	**With mitigation**
Extent	High (3)	Low (1)
Duration	Medium-term (3)	Medium-term (3)
Magnitude	Moderate (6)	Low (4)
Probability	Probable (3)	Probable (3)
Significance	**Medium (36)**	**Low (24)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	Yes	No
Can impacts be mitigated?	Yes	
Mitigation: "Mitigation", means to anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible. Provide a description of how these mitigation measures will be undertaken keeping the above definition in mind		
Residual Impacts: "Residual Risk", means the risk that will remain after all the recommended measures have been undertaken to mitigate the impact associated with the activity (Green Leaves III, 2014).		

Assessment of Cumulative Impacts

As per DEA's requirements, specialists are required to assess the cumulative impacts. In this regard, please refer to the methodology below that will need to be used for the assessment of Cumulative Impacts.

"Cumulative Impact", in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when

added to existing and reasonably foreseeable impacts eventuating from similar or diverse activities[2].

The role of the cumulative assessment is to test if such impacts are relevant to the proposed project in the proposed location (i.e. whether the addition of the proposed project in the area will increase the impact). This section should address whether the construction of the proposed development will result in:

» Unacceptable risk
» Unacceptable loss
» Complete or whole-scale changes to the environment or sense of place
» Unacceptable increase in impact

The specialist is required to conclude if the proposed development will result in any unacceptable loss or impact considering all the projects proposed in the area.

Example of a cumulative impact table:

Nature: Complete or whole-scale changes to the environment or sense of place (example)

Nature: **[Outline and describe fully the impact anticipated as per the assessment undertaken]**		
	Overall impact of the proposed project considered in isolation	***Cumulative impact of the project and other projects in the area***
Extent	Low (1)	High (3)
Duration	Medium-term (3)	Medium-term (3)
Magnitude	Low (4)	Moderate (6)
Probability	Probable (3)	Probable (3)
Significance	**Low (24)**	**Medium (36)**
Status (positive or negative)	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources?	No	Yes
Can impacts be mitigated?	Yes	Yes
Mitigation: "Mitigation", means to anticipate and prevent negative impacts and risks, then to minimise them, rehabilitate or repair impacts to the extent feasible. Provide a description of how these mitigation measures will be undertaken keeping the above definition in mind		
Residual Impacts: "Residual Risk", means the risk that will remain after all the recommended measures have been undertaken to mitigate the impact associated with the activity (Green Leaves III, 2014).		

[2] Unless otherwise stated, all definitions are from the 2014 EIA Regulations, GNR 326.

Annexure B – SPECIALIST EXPERTISE

IRIS SIGRID WINK

Profession	Civil Engineer (Traffic & Transportation)
Position in Firm	Associate
Area of Specialisation	Manager: Traffic & Transportation Engineering
Qualifications	PrEng, MSc Eng (Civil & Transportation)
Years of Experience	19 Years
Years with Firm	9 Years

SUMMARY OF EXPERIENCE

Iris is a Professional Engineer registered with ECSA (20110156). She joined JG Afrika (Pty) Ltd. in 2012. Iris obtained a Master of Science degree in Civil Engineering in Germany and has more than 15 years of experience in a wide field of traffic and transport engineering projects. Iris left Germany in 2003 and has worked as a traffic and transport engineer in South Africa and Germany. She has technical and professional skills in traffic impact studies, public transport planning, non-motorised transport planning and design, design and development of transport systems, project planning and implementation for residential, commercial and industrial projects and providing conceptual designs for the abovementioned. She has also been involved with transport assessments for renewable energy projects and traffic safety audits.

PROFESSIONAL REGISTRATIONS & INSTITUTE MEMBERSHIPS

PrEng - Registered with the Engineering Council of South Africa No. 20110156
Registered Mentor with ECSA for the Cape Town Office of JG Afrika
MSAICE - Member of the South African Institution of Civil Engineers
ITSSA - Member of ITS SA (Intelligent Transport Systems South Africa)
SAWEA - Member of the South African Wind Energy Association
SARF - South African Road Federation: Committee Member of Council
IRF - Global Road Safety Audit Team Leader

EDUCATION

1996 - Matric – Matric (Abitur) – Carl Friedrich Gauss Schule, Hemmingen, Germany
1998 - Diploma as Draughtsperson – Lower Saxonian State Office for Road and Bridge Engineering
2003 - MSc Eng (Civil and Transportation) – Leibniz Technical University of Hanover, Germany

SPECIFIC EXPERIENCE (Selection)

JG Afrika (Pty) Ltd (Previously Jeffares & Green (Pty) Ltd)
2016 – Date
Position – Associate

- **Kudusberg Windfarm** – Transport study for the proposed Kudusberg Windfarm near Sutherland, Northern Cape – Client: G7 Renewable Energies

- **Kuruman Windfarm –** Transport study for the proposed Kuruman Windfarm in Kuruman, Northern Cape – Client: Mulilo Renewable Project Developments
- **Coega West Windfarm** – Transportation and Traffic Management Plan for the proposed Coega Windfarm in Coega, Port Elizabeth – Client: Electrawinds Coega
- **Traffic and Parking Audits** for the Suburb of Groenvallei in Cape Town – Client: City of Cape Town Department of Property Management.
- **Road Safety Audit** for the Upgrade of N1 Section 4 Monument River – Client: Aurecon on behalf of SANRAL
- **Sonop Windfarm** – Traffic Impact Assessment for the proposed Sonop Windfarm, Coega, Port Elizabeth – Client: Founders Engineering
- **Universal Windfarm** - Traffic Impact Assessment for the proposed Universal Windfarm, Coega, Port Elizabeth – Client: Founders Engineering
- **Road Safety Audit** for the Upgrade of N2 Section 8 Knysna to Wittedrift – Client: SMEC on behalf of SANRAL
- **Road Safety Audit** for the Upgrade of N1 Section 16 Zandkraal to Winburg South – Client: SMEC on behalf of SANRAL
- **Traffic and Road Safety Studies** for the Improvement of N7 Section 2 and Section 3 (Rooidraai and Piekenierskloof Pass) – Client: SANRAL
- **Road Safety Appraisal**s for Northern Region of Cape Town – Client: Aurecon on behalf of City of Cape Town (TCT)
- **Traffic Engineering Services** for the Enkanini Informal Settlement, Kayamandi - Client: Stellenbosch Municipality
- **Lead Traffic Engineer** for the Upgrade of a 150km Section of the National Route N2 from Kangela to Pongola in KwaZulu-Natal, Client: SANRAL
- **Traffic Engineering Services** for the Kosovo Informal Settlement (which is part of the Southern Corridor Upgrade Programme), Client: Western Cape Government
- **Traffic and Road Safety Studies** for the proposed Kosovo Informal Housing Development (part of the Southern Corridor Upgrade Program), Client: Western Cape Government.
- **Road Safety Audit** Stage 3 – Upgrade of the R573 Section 2 between Mpumalanga/Gauteng and Mpumalanga/Limpopo, Client: AECOM on behalf of SANRAL
- **Road Safety Audit** Stage 1 and 3 – Upgrade of the N2 Section 5 between Lizmore and Heidelberg, Client: Aurecon on behalf of SANRAL
- **Traffic Safety Studies** for Roads Upgrades in Cofimvaba, Eastern Cape – Client: Cofimvaba Municipality
- **Road Safety Audit** Stage 1 and 3 – Improvement of Intersections between Olifantshoek and Kathu, Northern Cape, Client: Nadeson/Gibb on behalf of SANRAL
- **Road Safety Audit** Stage 3 – Upgrade of the Beacon Way Intersection on the N2 at Plettenberg Bay, Client: AECOM on behalf of SANRAL

- **Traffic Impact Assessment** for a proposed Primary School at Die Bos in Strand, Somerset West, Client: Edifice Consulting Engineers
- **Road Safety Audit** Stage 1 and 3 – Improvement of R75 between Port Elizabeth and Uitenhage, Eastern Cape, Client: SMEC on behalf of SANRAL

Annexure C – COMPLIANCE WITH APPENDIX 6 OF THE 2014 EIA REGULATIONS (AS AMENDED)

Requirements of Appendix 6 (Specialist Reports) of Government Notice R326 (Environmental Impact Assessment (EIA) Regulations of 2014, as amended)	***Section where this has been addressed in the Specialist Report***
1. (1) A specialist report prepared in terms of these Regulations must contain - *a) details of -* *i. the specialist who prepared the report; and* *ii. the expertise of that specialist to compile a specialist report including a curriculum vitae;*	*Annexure B*
b) a declaration that the specialist is independent in a form as may be specified by the competent authority;	*Attached*
c) an indication of the scope of, and the purpose for which, the report was prepared;	*Section 1*
(cA) an indication of the quality and age of base data used for the specialist report;	*n/a*
(cB) a description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	*Section 6*
d) the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	*n/a*
e) a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	*Section 1 and Annexure A*
f) details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives;	*Section 3*
g) an identification of any areas to be avoided, including buffers;	*Section 3*
h) a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	*n/a*
i) a description of any assumptions made and any uncertainties or gaps in knowledge;	*Section 1*
j) a description of the findings and potential implications of such findings on the impact of the proposed activity or activities;	*Section 5*
k) any mitigation measures for inclusion in the EMPr;	*Section 10*
l) any conditions for inclusion in the environmental authorisation;	*n/a*
m) any monitoring requirements for inclusion in the EMPr or environmental authorisation;	*Section 10*
n) a reasoned opinion- *i. whether the proposed activity, activities or portions thereof should be authorised;* *(iA) regarding the acceptability of the proposed activity or activities; and* *ii. if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;*	*Section 11*
o) a description of any consultation process that was undertaken during the course of preparing the specialist report;	*n/a*
p) a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	*n/a*
q) any other information requested by the competent authority.	*n/a*
(2) Where a government notice by the Minister provides for any protocol or minimum information requirement to be applied to a specialist report, the requirements as indicated in such notice will apply.	*n/a*