

TRAFFIC IMPACT STATEMENT

FOR THE

**PROPOSED DEVELOPMENT OF A 225MW SOLAR PV FACILITY
ON SEVERAL PORTIONS OF FARMS IN THE HANOVER
DISTRICT, EMTHANJENI LOCAL MUNICIPALITY, NORTHERN
CAPE PROVINCE**

OUR REF NO. 1700171

MAY 2017

Head Office

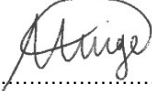
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0	Traffic Study Submitted	April 2017	ABK
1	Traffic Study Submitted (Access position identified)	May 2017	ABK
2	Traffic Study Submitted (Amended with Comments received from Ecoleges)	May 2017	ABK

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1 INTRODUCTION

Element Consulting Engineers (Pty) Ltd was appointed by Soventix South Africa (Pty) Ltd to prepare a Traffic Impact Statement for the proposed development of a 225MW solar PV facility on several portions of farms in the Hanover District, Emthanjeni Local Municipality, Northern Cape Province. This Traffic Impact Statement will address the following:

- Site Location and Description of the Development
- Existing Traffic Conditions
- Trip Generation and Distribution
- Access Arrangements

2 SITE LOCATION AND DESCRIPTION

The site is located to the north-east of the N10, approximately 28 km north-west of Hanover and 35 km south-east of De Aar. Three alternative portions of land have been identified for the development of the PV facility. Please refer to Appendix A for the Locality Plan and the location of the alternatives.

The footprint of the proposed development is approximately 520 ha. This will include three 75MW solar PV plants (170 ha each) with associated infrastructure and a sub-station that will tie into the ESKOM overhead 132KV or 400KV powerlines.

3 EXISTING TRAFFIC CONDITIONS

Traffic volumes along the N10 was obtained from SANRAL. The traffic information is recorded at a permanent counting station situated along the N10 at Km 14.60 (approximately 13 km south-east of the proposed solar plant).

The traffic information provides the following Average Daily Traffic (ADT) volumes recorded over the past 5 years. Refer to Table 1.

Table 1: Traffic Information

Year	To Hanover	To De Aar	Total Two-Way
2012	238	230	468
2013	264	269	533
2014	262	262	524
2015	234	236	470
2016	268	276	544

The traffic information that was received also indicates that the two-way Average Daily Truck Traffic (ADTT) is 75 which equates approximately 14% of the Average Daily Traffic. Furthermore, it is recorded that 86.8% of the traffic along this road is Day Traffic (06h00 – 20h00), while 13.2% of the traffic along this road is Night Traffic (20h00 – 06h00).

From this traffic information, the road carries very little traffic, when considering that the capacity of a two-lane, two-way highway is 2000 passenger cars per hour.

4 TRIP GENERATION AND DISTRIBUTION

No information regarding the trip generation rates for solar PV facilities are documented. The assumptions used in a previous study and information obtained from the client will be used. The trip generation for the construction and operational phases will be discussed separately.

4.1 Construction

The construction period for the complete 225MW solar PV facility is estimated as a maximum of 18 months. The delivery of the solar panels will be limited to the first 6 months of the contract period. The solar modules will be delivered by superlink trucks in 40' shipping containers. Information obtained from the client indicated that an estimated total of 900 trips will be generated over the first 6-months for the delivery of the solar panels. It is expected that the containers will be transported by road freight from Cape Town, along the N1 and past Hanover to the proposed site. This is illustrated in Picture 1 below.



Picture 1 Proposed Route for Delivery of Solar Panels

During the 18-month construction period, approximately 150 people will work on the site. The workforce will be travelling from De Aar and Hanover. It is expected that the people will travel by bus / taxi. It is assumed that 15 people will generate one vehicle (taxi / bus) trip and that 50% of the trips will be from Hanover's side and 50% of the trips will originate from De Aar's side.

Construction machinery will also be transported to the site and remain on site during the construction period. This machinery will be removed once construction is completed. It is expected that the construction equipment will typically include:

- a water tanker;
- a grader;
- a tip truck;
- cement mixers;
- compaction equipment; and
- light delivery vehicles.

It is anticipated that only the delivery of the solar panels and the personnel trips will influence the existing traffic operations on the affected road. The construction machinery will only have a traffic impact on delivery to and collection from the site and are therefore regarded as negligible.

Table 2 Trip Generation and Distribution during Construction Phase

Trip Generator	Total Trips	Daily Trips	Person Trips per Peak Hour	Peak Hour Vehicle Trips	From De Aar	From Hanover
Superlink Truck Trips	900	7*		4**		4
Person Trips			150	10***	5	5
Total Trips					5	9
* The daily amount of Superlink Truck to the site is determined by dividing the total amount (900) by the amount of working days (22 days) over 6 months, i.e. (900 / 6) / 22.						
** The peak hour trips for the Superlink Truck Trips is taken as 50% of the daily trips (this is very conservative, since the truck trips will not be confined to the peak hours)						
*** The peak hour trips for the workforce is determined by dividing the total workforce by 15, since it is assumed that the taxi's or buses will transport an average of 15 persons per vehicle (150 / 15)						

From Table 2 it is clear that the generated trips will have an insignificant impact on the existing peak hour traffic volumes.

4.2 Operation

Discussions with the client indicated that 44 permanent staff members will operate the proposed plant. These staff members will travel from De Aar and Hanover.

Light construction vehicles (water truck, refuse removal truck) will also use the proposed access. It is evident that even less traffic will be generated during the operational phase and will therefore not impact the existing traffic flow.

5 PROPOSED ACCESS

Access to the site will be required during the construction and operational phases of the project. The client intends to access the site from the N10 for Alternative 1. The closest kilometre marker to the proposed access position for Alternative 1 is N10-6 28.4. The access is situated approximately at km 28.5. The coordinates of the proposed access point are 30°53'10.40" S and

24°13'57.67" E.

For Alternative 2 and Alternative 3, access will be gained from the Burgerville / Elandsfontein road. This is an existing intersection situated approximately at km 29.5. The coordinates of this intersection are 30°52'31.59" S and 24°13'25.83" E.

5.1 Sight Distance

Sight distance at the proposed access should be provided in accordance to the SANRAL Geometric Design Guidelines (G2 Manual). The following sight distances displayed in Table 3 are required for different design vehicles turning right or left into the major road (N10) from the minor road (access to site).

Table 3 Sight Distance Requirements

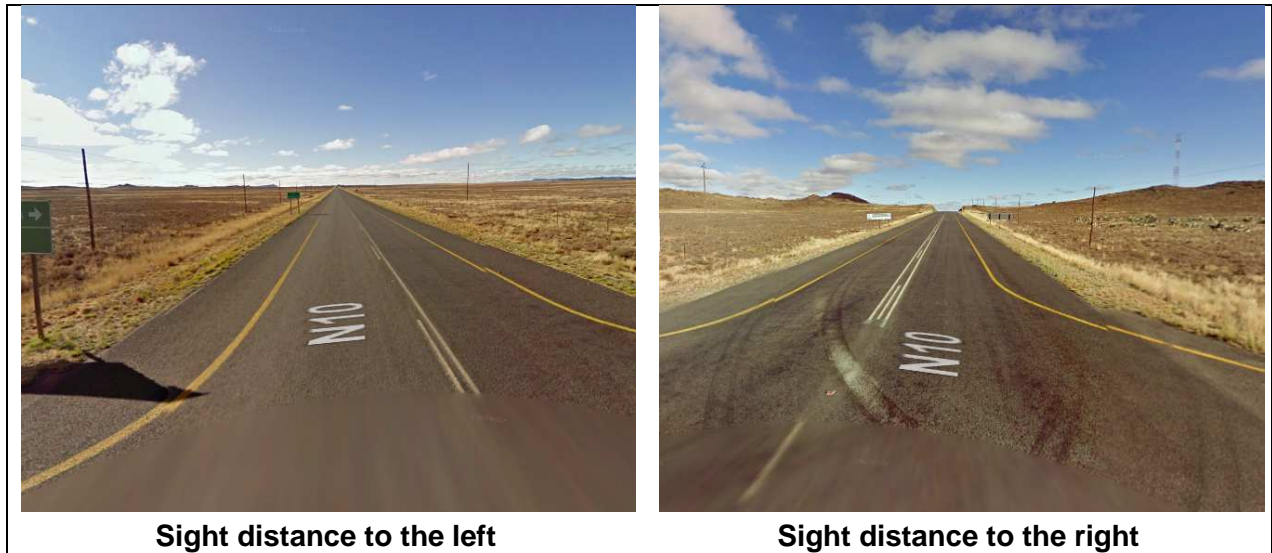
Design Vehicle	Travel time (s) at design speed of major road	Design Speed	Sight distance required (m)
Passenger car	7.5	120	250
Single-unit truck	9.5	120	317
Semi-trailer	11.5	120	384

It can be clearly seen on the images below that the access point to Alternative 1 is situated on a straight and flat stretch of road. Sight distance to both the left and right is sufficient. Refer to Picture 2.



Picture 2 Sight Distance to the left and right (Proposed Access)

The Burgerville / Elandsfontien access that will be used, should Alternative 2 or Alternative 3 be considered, also provides sufficient sight distance to the left and right. Refer to Picture 3.



Picture 3 Sight Distance to the left and right (Existing Access)

5.2 Turning Lanes

Considering the traffic volumes on the road and the insignificant number of trips that will be generated during the construction and operational phases of the project, it is not proposed that additional turning lanes be constructed at the access.

5.3 Location of Accesses

Picture 4 illustrates the location of the proposed access to Alternative 1 in relation to other accesses and intersections in the area. The closest intersection to the north-west of the proposed access to Alternative 1 is 1475 m (Elandsfontein / Burgerville intersection) and 2470 m to the south-east.



Picture 4 Location of Adjacent Accesses

Application for approval of the proposed access location required for Alternative 1 needs to be obtained from SANRAL. Once the location of the access is approved, the geometric design of the access, according to SANRAL standards, can be undertaken.

6 CONCLUSIONS AND RECOMMENDATIONS

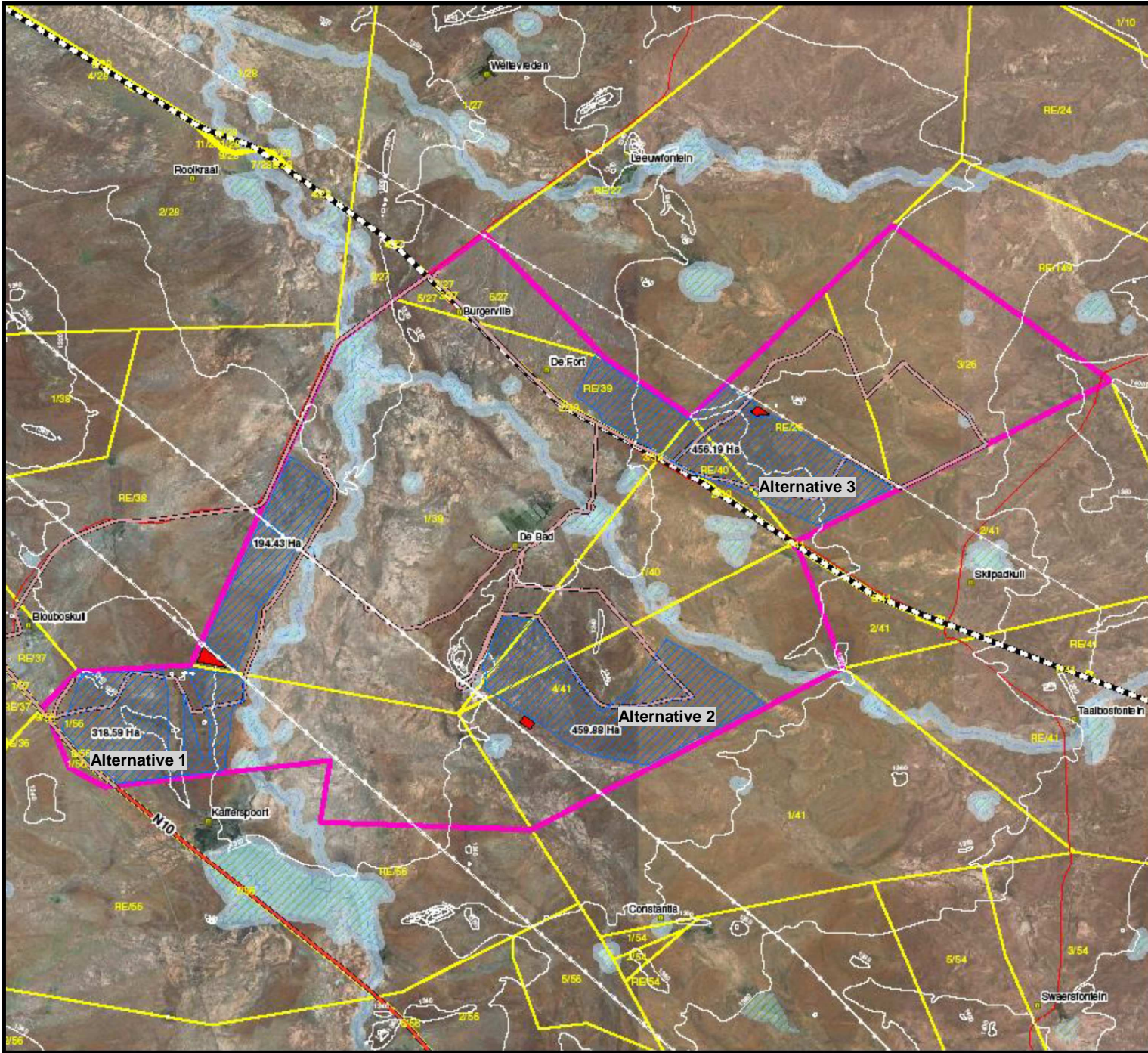
From the above, the following conclusions are made:

- Traffic volumes along the N10 was obtained from SANRAL. These volumes indicate that the N10 carries very little traffic past the proposed site.
- The anticipated traffic volumes that will be generated during the construction and operational phases of the project will have an insignificant impact on the road network.
- Sight distance to the left and right of the proposed access to Alternative 1 and the existing Elandsfontein / Burgerville intersection for Alternative 2 and Alternative 3 is sufficient.
- It is not foreseen that any additional turning lanes be constructed at the access.
- The exact position of the access to Alternative 1 must be approved by SANRAL.

Based on the conclusions above, it is recommended that the proposed development of a 225MW solar PV facility be approved. Access to the plant from the N10 should comply with the relevant standards.

Appendix A: Locality Plan





SOVENTIX SA
PROPOSED SOLAR INSTALLATION
 situated on
 PORTIONS RE/26, 3/26, 3/27, 5/27 - 8/27,
 RE/39, 1/39, 2/39, RE/40, 1/40, 2/40, 4/41, 1/56
 AND 8/56, REGISTRATION DIVISION HANOVER RD.

Legend - general

	Towns and settlements		Railway line
	Proposed solar PV array site		GPS Tracks
	Proposed substation site		Provincial roads
	Allocated property		Local roads
	Farm portions		Eskom powerlines
	NFEPA wetlands		Rivers

Legend - site sensitivity

Threatened Ecosystems
 (Provincial level)

Least threatened

DATE: 18/10/2014
 LOCAL AUTHORITY: GEMENEN LOCAL MUNICIPALITY
 PLAN NUMBER: Park, Grondopp. Site 05
 SCALE: 1:50 000
 PREPARED FOR: Ecological Environmental Consultants
 DRAWN: DIGITAL GARTH
 COORDINATE SYSTEM: HARTWIGER-SIGK 1984

