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Appendix D7:
Transport Impact Assessment

INNOVATIVE
TRANSPORT
SOLUTIONS

Transport Impact Assessment

De Rust Houmoed Wind Energy Facility Pofadder

Northern Cape

May 2023

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Report Type	Transport Impact Assessment
Title	De Rust Houmoed Wind Energy Facility Pofadder
Client	Enviro-insight CC
Location	Northern Cape
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This transport impact study was prepared in accordance with the South African Traffic Impact and Site Traffic Assessment Manual (TMH 16, COTO, Aug 2012), by a suitably qualified and registered professional traffic engineer. Details of any of the calculations on which the results in this report are based will be made available on request.

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Abbreviations

AMG – Access Management Guidelines (Western Cape Government)

CM – Critical Movement

DR – Divisional Road

HCM – Highway Capacity Manual

LOS – Level of Service

MOE – Measures of Efficiency

MR – Provincial Main Road

OP – Minor Road (Ondergeskikte Pad)

SDP – Site Development Plan

SSD – Shoulder Sight Distance

TIA – Traffic Impact Assessment

1.0 INTRODUCTION

It is proposed to develop De Rust Solar and Wind Energy Facilities (WEF) near the town Pofadder in the Northern Cape. The De Rust Solar WEF will be implemented in two projects on Farm 148 Houmoed and Remainder of Farm 206 Houmoed. The De Rust Solar Farm will be developed as a separate project on Farm 147 Samoep This report summarises an investigation of the transport impact related to the construction and operational phases of the proposed Houmoed WEF.

2.0 LOCALITY

The De Rust Solar and WEF is located approximately 15km south of the town of Pofadder in the Northern Cape. The site is located within the Khâi-Ma Local Municipality which falls within the Namakwa District Municipality. The site can be reached via a proposed access off the R358. The WEF will be located on Farm 148 Samoep, a portion of Remainder of Farm 206 Houmoed and a portion of Farm 147 Samoep.

Refer to **Figure 1** in Appendix A for the Locality Plan of the De Rust Solar and WEF project.

3.0 PROPOSED DEVELOPMENT

The De Rust WEF will consist of a total of 71 wind turbines with a generation capacity of up to 7.5 MW per turbine. Each turbine will have a hub height of up to 150m and a rotor diameter of up to 175m. The total development is split into two projects for the WEF plus the Solar Farm. Refer to **Table 1** which indicates the number of turbines per project. The combined site layout for the De Rust WEF and Solar project is shown in **Figure 2A** in Appendix A. The proposed site layout for Houmoed WEF is shown in **Figure 2B** in Appendix A.

Table 1: De Rust WEF and Solar Projects

Phase	Number of turbines
Houmoed (WEF)	39
Houmoed (WEF)	32
Samoep (Solar)	-
TOTAL	**71**

Additional ancillary infrastructure would include underground and above-ground cabling between components, onsite substation/s, Battery Energy Storage Systems (BESS), foundations to support turbine towers, internal/access roads linking the wind turbines and other infrastructure on site, and a permanent workshop area and office for control, maintenance, and storage. A formal laydown area for the construction period, containing a temporary maintenance and storage building along with a guard cabin will also be established.

Components to be imported can be shipped to Saldanha or Cape Town harbours and then transported by road depending on the different load restrictions. Specialised high lifting and heavy load capacity cranes will be utilised to erect the turbines. The total construction period is expected to be between 12 to 24 months.

4.0 TRAFFIC ANALYSIS SCOPE

This report evaluates the expected traffic impact of the proposed development during the construction and operational phases. Possible access routes to the site are assessed and comments are made on the condition of the existing roads in the site vicinity. Improvements to the surrounding road network will be recommended where appropriate.

The report is based on existing available information on the road network, road condition information obtained during site visits and an assessment of the expected traffic volumes generated by the construction and operational phases of the proposed De Rust Solar and WEF.

5.0 EXISTING CONDITIONS

5.1 Existing Cross Sections and Surface Conditions

The National Road (N14) and the R358 are the only major roads in the site vicinity. The N14 has a posted speed limit of 120 km/h. The section of the N14 in the vicinity of the site has a typical rural formation of a National Road, paved with one lane per direction of travel with shoulders along both sides of the road. The lanes are 3.7m wide with 2m shoulders. The typical cross-section of the N14 in the site vicinity is shown in **Photos 1** in Appendix B. The R358 is 8m wide gravel road. The surface condition of the R358 in the site vicinity is poor condition. Refer to **Photos 2** in Appendix B for the typical cross section of the R358.

5.2 Existing Traffic Volumes

The existing traffic conditions are based on the traffic volumes extracted from the SANRAL Comprehensive Traffic Observation (CTO) Stations and Provincial count stations in the area. The table below illustrates the current annual average daily traffic volumes (AADT), the annual daily truck traffic volumes and the peak hour volumes on the road network in the site vicinity.

Table 2: Existing Traffic Volumes

Roadway	AADT	ADTT	Peak Hour Volume	% Heavy Vehicles
N14	728	143	73	20%
N14	53	2	N/A	3%

6.0 SITE ACCESS

Access to the site is proposed via new and existing farm accesses off the R358 as illustrated on the Site Layout Plan Figure 2B in Appendix A. For reference purposes that accesses are labelled Access 3 & 4 respectively.

The required shoulder sight distance (SSD) for heavy vehicles along roads with a posted speed limit of 60km/h is 220 metres based on the geometric design guidelines of the UTG. The available SSD is more than 300 metres in both directions from all accesses, which is acceptable and safe for the existing posted speed limits along the R358. The current SSD along the R358 is illustrated in **Photo 2** to **6** in Annexure B.

7.0 TRANSPORT ROUTE

Based on the abnormal load requirements, preliminary routes as outlined in **Figure 3A** & **3B** in Appendix C are proposed for transporting the large equipment from the Saldanha Bay and Cape Town harbours or the Atlantis industrial area to the site.

The Cape Town route is shown in **Figure 3A** and is approximately 670 km in length. It follows the R27 to Melkbosstrand and then the via the Melkbosstrand Road to the N7, then via the N7 north to Springbok, then via the N14 to Pofadder and via the R358 to the site.

The Saldanha route is shown in **Figure 3B** and is approximately 647 km in length. It follows Trunk Road 8501 to the R27, then via the R27 to Velddrif, then the R399 to Piketberg, then the route follows the N7 north to Springbok then via the N14 to Pofadder and via the R358 to the site.

Some tower components can also be manufactured in Atlantis and the route from Atlantis to Pofadder can follow either of the two routes discussed above.

The final route will have to be checked for compliance during the final design stages of the project. Permits will need to be obtained from the relevant road authorities for all abnormal loads and the specific route will be specified based on the characteristics of each load type.

8.0 TRAFFIC IMPACT ANALYSIS

The expected effects of traffic that would be generated by the proposed development during peak hours were analysed as follows:

- The **Existing (2023) traffic** volumes were assessed for the study network in the vicinity of the site.
- The **Background (2028) traffic** volumes were assessed for the study network in the vicinity of the site. These are the traffic volumes that would be on the road network in the absence of the proposed development in five years' time (No-Go Alternative).
- **Construction Phase Traffic** was assessed for the study network
- **Site-generated trips** were estimated for the proposed development;
- The construction phase traffic and the assigned site-generated traffic from the proposed development were added to the **background traffic** volumes to determine the **total traffic** conditions during the construction phase and with the development completed.

8.1 Year 2028 Background Traffic Conditions

For the purposes of this study, year 2027 background traffic volumes were developed by applying a 3.0 *percent annual traffic growth rate* to the existing traffic volumes on the major links. This estimated growth rate was assumed to allow for the additional traffic volumes that will be generated by other in-process and future developments in the vicinity of the proposed development.

Due to the low traffic volumes along the surrounding road network, it is expected that the road network will continue to operate at acceptable levels-of-service during the background conditions. The roads in the site vicinity are in a fair condition and no major maintenance will be required in the near future.

8.2 Construction Phase

A large amount of traffic will be generated during the construction phase. The following activities will probably occur during the construction phase:

- Construction of the internal access roads,
- Stripping and stockpiling of topsoil,
- Excavation and construction of the foundations for the wind turbines,
- Construction of the operations building,
- Erection/Assembly and disassembly of the cranes
- Assembly of the towers, nacelles and blades,
- Trenching for cabling and
- Reinstatement of the site.

The internal access roads to the turbines will be constructed mainly of local materials sourced on site if the material is suitable, otherwise material will be imported from commercial sites. These roads will be retained and used for inspection and maintenance of the wind turbines.

The tower foundations are large reinforced concrete footings. It is assumed that the material removed during excavation will be utilised within the site to create hardstand areas for the cranes and in reinstating the site after construction. It is assumed that the concrete will be mixed on site and the raw materials will be transported to the site via the existing road network. It is assumed that up to 44 truckloads will be required for the foundation of each wind turbine.

The components of the wind turbines will be transported to the site from Saldanha or Cape Town harbours and approximately 9 abnormal truck loads are required per wind turbine.

8.2.1 Trip Generation

Estimates of the peak hour vehicle trips for new developments are typically based on empirical observations at similar land uses. The estimates summarised in **Table 3** are based on information sourced from other similar projects. It is also based on the total number of wind turbines that will be constructed for the Houmoed WEF project, which is 39 turbines.

Table 3: Expected Generated Truck Trips during the Construction Phase

Material	Approximate Number of Truck Loads Required
Foundations	1 408
Construction Cranes	100
Tower Sections	128
Nacelles	32
Blades	96
Switch Cabinets	32
TOTAL	**1 796**

Although the construction period can be between 18 to 30 months, for the purposes of this study it is assumed that most the construction work can be completed within an 18-month period to represent a possible worst-case scenario. It is expected that approximately 1 796 trucks loads will be required during the 18-month construction period, working approximately 450 days during the construction period. This means that on average approximately 4 trucks will visit the site per day (3 160/450). For an 8-hour day, this equates to approximately 8 truck trips per day.

Based on information sourced from other similar projects it is assumed that approximately 200 construction workers could be employed during the peak construction period. It can be expected that the bulk of these workers will commute to/from the construction site via bus or minibus taxis. It is assumed that 70 percent of the construction staff will be transported with minibus taxis (with an average occupancy of 12 passengers per vehicle) and the remaining 30 percent with private vehicles.

If 70 percent of the construction staff travels with minibus taxis with an average occupancy of 12 passengers per vehicle it equates to 12 minibuses visiting the site in the morning and afternoon peak hours. If the remaining 30 percent travel with private vehicles, it equates to 176 motor vehicle and truck trips during the average weekday with approximately 84 trips during the a.m. and p.m. peak hours when workers are dropped off or picked up.

8.2.2 Trip Distribution and Assignment

It is expected that most of the trips to/from the proposed Wind Farm will travel on the N14. The trucks delivering the components and equipment will come via the N14 from both directions. Most of the trucks delivering raw material for foundations and road construction material will probably come from commercial sources in Aggeneys, Pofadder and Springbok.

8.3 Transport Impact Assessment

8.3.1 Definitions of terminology

The impacts that the development of the Red Sands Solar and WEF will have on traffic on the surrounding road network is assessed in this section. Refer to **Table 4** which provides definitions of the terminology used in this section.

Table 4: Definitions of terminology

ITEM	DEFINITION
EXTENT	
Local	Extending only as far as the boundaries of the activity, limited to the site and its immediate surroundings
Regional	Impact on the broader region
National	Will have an impact on a national scale or across international borders
DURATION	
Short-term	0-5 years
Medium- Term	5-15 years
Long-Term	>15 years, where the impact will cease after the operational life of the activity
Permanent	Where mitigation, either by natural process or human intervention, will not occur in such a way or in such a time span that the impact can be considered transient.
MAGNITUDE OR INTENSITY	
Low	Where the receiving natural, cultural or social function/environment is negligibly affected or where the impact is so low that remedial action is not required.
Medium	Where the affected environment is altered, but not severely and the impact can be mitigated successfully and natural, cultural or social functions and processes can continue, albeit in a modified way.
High	Where natural, cultural or social functions or processes are substantially altered to a very large degree. If a negative impact, then this could lead to unacceptable consequences for the cultural and/or social functions and/or irreplaceable loss of biodiversity to the extent that natural, cultural or social functions could temporarily or permanently cease.
PROBABILITY	
Improbable	Where the possibility of the impact materialising is very low, either because of design or historic experience
Probable	Where there is a distinct possibility that the impact will occur
Highly Probable	Where it is most likely that the impact will occur
Definite	Where the impact will undoubtedly occur, regardless of any prevention measures
SIGNIFICANCE	
Low	Where a potential impact will have a negligible effect on natural, cultural or social environments and the effect on the decision is negligible. This will not require special design considerations for the project
Medium	Where it would have, or there would be a moderate risk to natural, cultural or social environments and should influence the decision. The project will require modification or mitigation measures to be included in the design
High	Where it would have, or there would be a high risk of, a large effect on natural, cultural or social environments. These impacts should have a major influence on decision making.
Very High	Where it would have, or there would be a high risk of, an irreversible negative impact on biodiversity and irreplaceable loss of natural capital that could result in the project being environmentally unacceptable, even with mitigation. Alternatively, it could lead to a major positive effect. Impacts of this nature must be a central factor in decision making.
STATUS OF IMPACT	
Whether the impact is positive (a benefit), negative (a cost) or neutral (status quo maintained)	
DEGREE OF CONFIDENCE IN PREDICTIONS	
The degree of confidence in the predictions is based on the availability of information and specialist knowledge (e.g. low, medium or high)	
MITIGATION	
Mechanisms used to control, minimise and or eliminate negative impacts on the environment and to enhance project benefits Mitigation measures should be considered in terms of the following hierarchy: (1) avoidance, (2) minimisation, (3) restoration and (4) off-sets.	

8.3.2 Scoring System for Impact Assessment Ratings

To comparatively rank the impacts, each impact has been assigned a score using the scoring system outlined in the **Table 5** below. This scoring system allows for a comparative, accountable assessment of the indicative cumulative positive or negative impacts of each aspect assessed.

Table 5: Scoring System

IMPACT PARAMETER	SCORE	
Extent (A)	**Rating**	
Local	1	
Regional	2	
National	3	
Duration (B)	**Rating**	
Short term	1	
Medium Term	2	
Long Term	3	
Permanent	4	
Probability (C)	**Rating**	
Improbable	1	
Probable	2	
Highly Probable	3	
Definite	4	
IMPACT PARAMETER	**NEGATIVE IMPACT SCORE**	**POSITIVE IMPACT SCORE**
Magnitude/Intensity (D)	**Rating**	**Rating**
Low	-1	1
Medium	-2	2
High	-3	3
SIGNIFICANCE RATING (F) = (A*B*D)*C	**Rating**	**Rating**
Low	0 to - 40	0 to 40
Medium	- 41 to - 80	41 to 80
High	- 81 to - 120	81 to 120
Very High	> - 120	> 120

8.3.3 Construction Phase

Based on the expected number of construction trips generated by the proposed development the existing road network has sufficient capacity to accommodate the additional trips from an operational perspective. During construction it is expected that road surfaces of the gravel roads will require maintenance to prevent damage to the road structure.

It is recommended that once construction is completed the public roads should be inspected and repaired where necessary.

Table 6 below summarises the transport impacts identified and expected as a result of the increase in traffic volumes during the construction phase.

Table 6: Increased Traffic Volumes during Construction Period

IMPACT NATURE	Increase in traffic volumes on the surrounding road network as a result of construction traffic		STATUS	NEGATIVE
Impact Description	During the construction phase there will be an increase in traffic volumes on the surrounding road network that will impact on the general road users.			
Impact Source(s)	Construction Traffic			
Receptor(s)	General public/Road users			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:	1	No-Go Alternative:	1
DURATION (B)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:	1	No-Go Alternative:	1
PROBABILITY (C)	Preferred Alternative:	3	Preferred Alternative:	2
	No-Go Alternative:	3	No-Go Alternative:	2
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	-1	Preferred Alternative:	-1
	No-Go Alternative:	-1	No-Go Alternative:	-1
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**-3**	Preferred Alternative:	**-2**
	No-Go Alternative:	**-3**	No-Go Alternative:	**-2**
CUMULATIVE IMPACTS	Low			
CONFIDENCE	High			
MITIGATION MEASURES	• Construction traffic should not be allowed on the public road network during the typical weekday a.m. and p.m. peak hours in built up areas. • These measures will be included in the Transport Management Plan			

Table 7 below summarises the transport impacts identified and expected as a result of accommodating heavy loads during the construction phase.

Table 7: Traffic Impact significance of Heavy Loads during the construction phase

IMPACT NATURE	Gravel loss and possible damage to the road layer works. as a result of additional truck traffic and heavy load truck traffic during the construction phase.		STATUS	NEGATIVE
Impact Description	During the construction phase there will be gravel loss and possible damage to the road layer works along the R358 as a result of additional truck traffic and heavy load truck traffic delivering equipment to the site.			
Impact Source(s)	Construction Traffic			
Receptor(s)	General public/Road users			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:	1	No-Go Alternative:	1
DURATION (B)	Preferred Alternative:	1	Preferred Alternative:	1

	No-Go Alternative:	1	No-Go Alternative:	1
PROBABILITY (C)	Preferred Alternative:	3	Preferred Alternative:	2
	No-Go Alternative:	3	No-Go Alternative:	2
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	-2	Preferred Alternative:	-1
	No-Go Alternative:	-2	No-Go Alternative:	-1
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**-6**	Preferred Alternative:	**-2**
	No-Go Alternative:	**-6**	No-Go Alternative:	**-2**
CUMULATIVE IMPACTS	Low			
CONFIDENCE	High			
MITIGATION MEASURES	• Resurfacing of sections along the R358, where required and regular road maintenance i.e. grading of the road once every two weeks during the construction phase. • The road can also be sprayed with water (grey water if available) once a day to limit dust pollution and gravel loss.			

8.4 Operational Phase

The operational phase of this project is not expected to generate significant traffic volumes. The typical day-to-day activities will probably only be service vehicles undertaking general maintenance at the site.

Table 6 below summarises the transport impacts identified and expected during the operational phase.

IMPACT NATURE	**Increase in traffic volumes on the surrounding road network during the operational phase.**		**STATUS**	**NEGATIVE**
Impact Description	During the operational phase there will be a slight increase in traffic volumes on the surrounding road network that might impact on the general road users and result in gravel loss along the R358.			
Impact Source(s)	Operational Traffic			
Receptor(s)	General public/Road users			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:	1	No-Go Alternative:	1
DURATION (B)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:	1	No-Go Alternative:	1
PROBABILITY (C)	Preferred Alternative:	3	Preferred Alternative:	2
	No-Go Alternative:	3	No-Go Alternative:	2
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	-1	Preferred Alternative:	-1
	No-Go Alternative:	-1	No-Go Alternative:	-1
SIGNIFICANCE	Preferred Alternative:	**-3**	Preferred Alternative:	**-2**

RATING (F) = (A*B*D)*C	No-Go Alternative:	**-3**	No-Go Alternative:	**-2**
CUMULATIVE IMPACTS	Low			
CONFIDENCE	High			
MITIGATION MEASURES	• Routine road maintenance by the relevant Roads Authority.			

8.5 Decommissioning Phase

If the wind farm is not upgraded at the end of the typical lifespan (20 to 25 years from the date of commissioning) the site will be decommissioned. The decommissioning of the De Rust Houmoed WEF is expected to take between 6 to 12 months. The modular components would be removed and recycled, and all disturbed areas will have to be appropriately rehabilitated.

The transport impact during the decommissioning phase will be similar or less than the transport impact during the construction phase. The surrounding road network has sufficient capacity to accommodate the expected traffic volumes associated with the decommissioning phase.

Table 8 below summarises transport impacts identified and expected during decommissioning phase of the project.

Table 8: Traffic Impact significance of Heavy Loads during the decommissioning phase

IMPACT NATURE	**Gravel loss and possible damage to the road layer works. as a result of additional truck traffic and heavy load truck traffic during the decommissioning phase.**		**STATUS**	**NEGATIVE**
Impact Description	During the decommissioning phase there will be gravel loss and possible damage to the road layer works along the R358 as a result of additional truck traffic and heavy load truck traffic removing equipment from the site.			
Impact Source(s)	Construction Traffic			
Receptor(s)	General public/Road users			
PARAMETER	**WITHOUT MITIGATION**	**SCORE**	**WITH MITIGATION**	**SCORE**
EXTENT (A)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:	1	No-Go Alternative:	1
DURATION (B)	Preferred Alternative:	1	Preferred Alternative:	1
	No-Go Alternative:	1	No-Go Alternative:	1
PROBABILITY (C)	Preferred Alternative:	3	Preferred Alternative:	2
	No-Go Alternative:	3	No-Go Alternative:	2
INTENSITY OR MAGNITUDE (D)	Preferred Alternative:	-2	Preferred Alternative:	-1
	No-Go Alternative:	-2	No-Go Alternative:	-1
SIGNIFICANCE RATING (F) = (A*B*D)*C	Preferred Alternative:	**-6**	Preferred Alternative:	**-2**
	No-Go Alternative:	**-6**	No-Go Alternative:	**-2**

CUMULATIVE IMPACTS	Low
CONFIDENCE	High
MITIGATION MEASURES	• Resurfacing of sections along the R358, where required and regular road maintenance i.e. grading of the road once every two weeks during the decommissioning phase. • The road can also be sprayed with water (grey water if available) once a day to limit dust pollution and gravel loss.

8.6 Cumulative Impacts

To assess the cumulative impact, it will be assumed that all proposed and/or approved renewable energy projects within a 50km radius from the site will be constructed simultaneously.

There are several renewable energy projects within a 50km radius from the De Rust Solar and WEF project. The construction and decommissioning phases of these projects are the only significant traffic generators. These are short term phases and the impacts on the surrounding road network is temporary. Even if all these projects are constructed and decommissioned simultaneously, the road authority will evaluate the applications for the abnormal loads associated with these projects and liaise with the developers to ensure that loads on the public roads are staggered to ensure that the traffic impact is acceptable.

Refer to **Table 9** which provides a summary of the overall transport impact related to the development of the De Rust Solar and WEF project.

Table 9: Summary of overall Significance

DESCRIPTION OF IMPACT	Overall Significance (With Mitigation)	
	No-Go Alternative	Preferred Alternative
Increase in traffic volumes on the surrounding road network as a result of construction traffic	Low	Low
Gravel loss and possible damage to the road layer works. as a result of additional truck traffic and heavy load truck traffic during the construction phase	Low	Low
Increase in traffic volumes on the surrounding road network during the operational phase.	Low	Low
Gravel loss and possible damage to the road layer works. as a result of additional truck traffic and heavy load truck traffic during the decommissioning phase	Low	Low

8.7 Alternative Development Proposals

No other feasible site alternatives have been proposed for the establishment of the proposed wind energy facility. Therefore, no site alternatives are evaluated in this report.

8.8 Traffic Management and Transportation Plan

During the construction phase there will be an increase in truck traffic along the roads in the site vicinity, compared to the current truck traffic along these roads. However, the expected total traffic volumes along these roads will still be well within the function of the roads and no operational or safety issues are expected. Due to the rural nature of the area around the development site the daily traffic distribution profile along the roads in the site vicinity is random with no specific peak during the day.

It is recommended that construction and abnormal load traffic should be limited to outside the typical traffic peaks in build-up areas and through towns. Provincial and Local traffic officials should assist abnormal load vehicles through the towns. No significant road safety issues are expected in terms of possible vehicle and pedestrian conflicts. The construction traffic will have an impact on road users and pedestrians along the surrounding road network, but with effective traffic management the impact can be minimised.

Most of the equipment and construction material will be delivered to the site with heavy vehicles. The turbine components will be transported by abnormal load vehicles. It is expected that the delivery of the equipment will occur over an 18-month period and the impact of the delivery vehicles on the existing traffic along the road network in the site vicinity will be acceptable. All deliveries with abnormal loads will operate under an approved transportation plan with the necessary traffic routes and traffic accommodation plans in place.

9.0 CONCLUSIONS AND RECOMMENDATIONS

This transport impact assessment was prepared for the proposed De Rust Houmoed WEF project near the town Pofadder in the Northern Cape. This report summarises the existing transportation conditions within the site vicinity and provides an assessment of the transportation impacts of the proposed development on the surrounding transportation system.

This traffic impact analysis resulted in the following conclusions and recommendations.

Existing Traffic Conditions

- The current demand on the existing road network in the site vicinity is low and the road network and intersections operate at acceptable levels of service.

2028 Background Traffic Conditions

- A growth rate of 3 percent per annum was applied to the existing traffic volumes to determine the 2028 background traffic conditions.
- All the intersections and roadways will continue to operate at acceptable levels-of-service in the future during the worst peak hours of the year without the proposed development.

Access

- Access is proposed via new and existing farm accesses off the R358.

Construction Phase

- It is expected that the construction phase of the proposed development could generate up to 176 vehicular trips during the average weekday.
- Access to the site is proposed via the R358 and should be constructed to accommodate abnormal loads vehicles, including relevant turning movements.

Operational Phase

- The operational phase of this project is not expected to generate significant traffic volumes. The typical day-to-day activities will probably only be service vehicles undertaking general maintenance at the site.

Decommissioning Phase

- If the wind farm is not upgraded at the end of the typical lifespan (20 to 25 years) the site will be decommissioned. The decommissioning of the De Rust Houmoed WEF is expected to take between 6 to 12 months. The expected transport impact on the road network during the decommissioning phase will be similar to the transport impact during the construction phase. The surrounding road network has sufficient capacity to accommodate the expected traffic volumes associated with the decommissioning of the wind farm.

Cumulative Impact

- There are several renewable energy projects within a 50km radius from the De Rust Solar and WEF project. The construction and decommissioning phases of these projects are the only significant traffic generators. These are short term phases and the impacts on the surrounding road network is temporary. Even if all these projects are constructed and decommissioned simultaneously, the road authority will evaluate the applications for the abnormal loads associated with these projects and liaise with the developers to ensure that loads on the public roads are staggered to ensure that the traffic impact is acceptable.

Alternative Development Proposal

- No other feasible site alternatives have been proposed for the establishment of the proposed wind energy facility. Therefore, no site alternatives are evaluated in this report.

Traffic Management and Transportation Plan

- During the construction phase there will be an increase in truck traffic along the roads in the site vicinity, compared to the current truck traffic along these roads. However, the expected total traffic volumes along these roads will still be well within the function of the roads and no operational or safety issues are expected.
- It is recommended that construction and abnormal load traffic should be limited to outside the typical traffic peaks in build-up areas and through towns.
- Most of the equipment and construction material will be delivered to the site with heavy vehicles. The turbine components will be transported by abnormal load vehicles. It is expected that the delivery of the equipment can occur over a 18-month period and the impact of the delivery vehicles on the existing traffic along the road network in the site vicinity will be acceptable. All deliveries with abnormal loads will operate under an approved transportation plan with the necessary traffic routes and traffic accommodation plans in place.

Based on the evaluation as discussed in this report the existing road network has sufficient spare capacity to accommodate trip generation associated with the proposed development, without any road upgrades required to the existing road infrastructure. It is recommended that the proposed De Rust Houmoed WEF project be approved from a transport impact perspective.

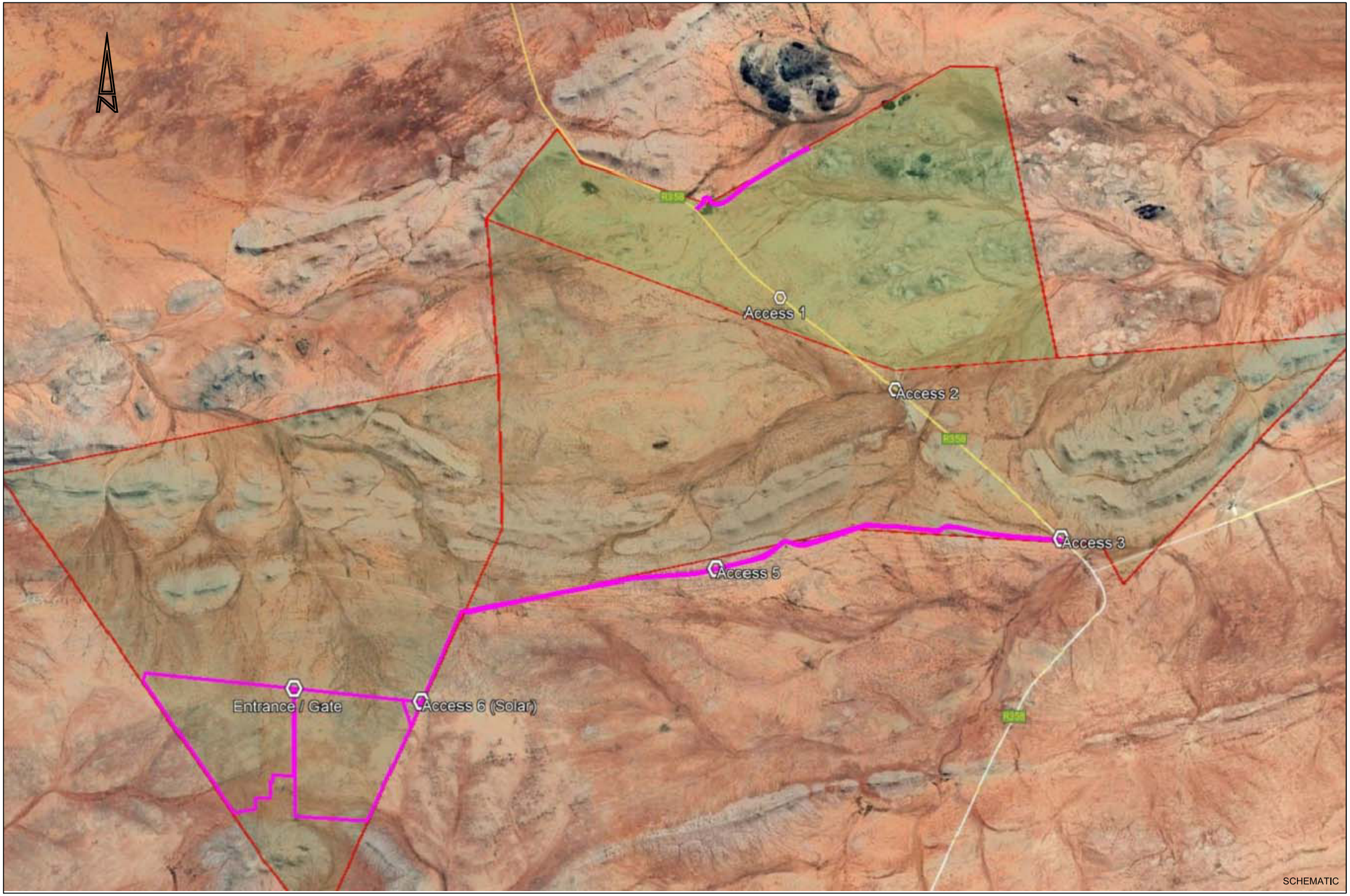
REFERENCES

1. Highway Capacity Manual (HCM).
2. Western Cape Government, Access Management Guidelines. 2020
3. Transportation Research Board Highway Capacity Manual, Special Report No. 209. 2000
4. Committee of Transport Officials, South African Trip Data Manual, TMH 17, September 2017
5. Committee of Transport Officials, South African Impact and Site Traffic Assessment Manual, TMH 16 Volume 1, August 2012.

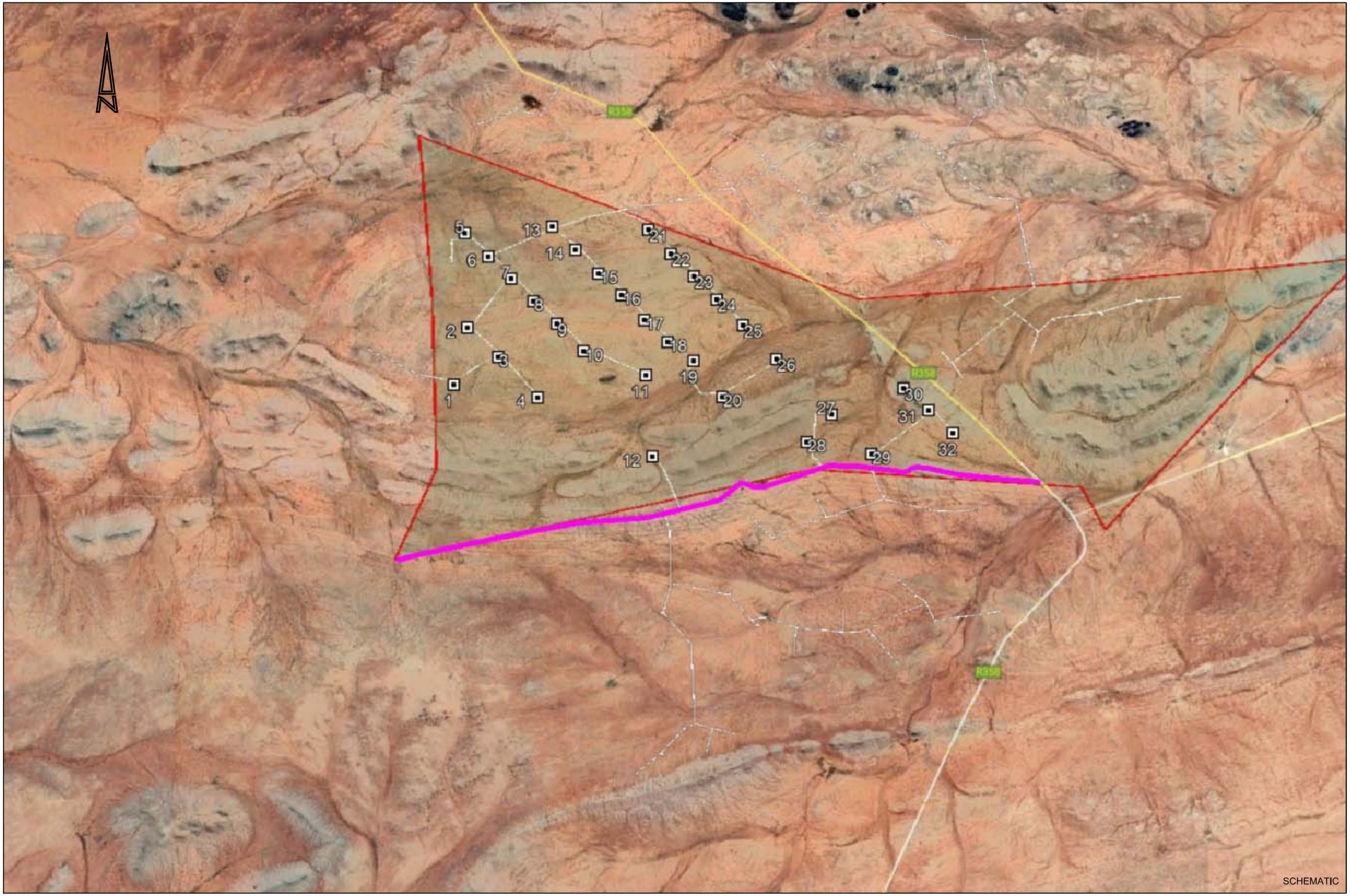
Appendix A

Figures

PROJECT:	FIGURE:	NUMBER:
DE RUST POFADDER SOLAR AND WIND ENERGY PROJECTS	LOCALITY PLAN	1



PROJECT:	FIGURE:	NUMBER:
DE RUST POFADDER SOLAR AND WIND ENERGY PROJECTS	COMBINED PROJECT SITE LAYOUT	2A



PROJECT:	FIGURE:	NUMBER:
DE RUST POFADDER SOLAR AND WIND ENERGY PROJECTS	HOUMOED REMAINDER 206 SITE LAYOUT	2B

PROJECT:	FIGURE:	NUMBER:
DE RUST POFADDER SOLAR AND WIND ENERGY PROJECTS	ABNORMAL LOAD ROUTE CAPE TOWN HARBOUR TO SITE	3A

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PROJECT:	FIGURE:	NUMBER:
DE RUST POFADDER SOLAR AND WIND ENERGY PROJECTS	ABNORMAL LOAD ROUTE SALDANHA BAY HARBOUR TO SITE	3B

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Appendix B

Photographs

Photo 1: Westbound view along the N14 towards Aggeneys

Photo 2: Northbound view along the R358 from Access 1 (>500m)

Photo 3: SSD to the North along the R358 from the Access 3 West (>500m)

Photo 4: SSD to the South along the R358 from the Access 3 West (>500m)

Photo 5: SSD to the North along the R358 from Access 4 (>500m)

Photo 6: SSD to the South along the R358 from Access 4 (>500m)