

Douglas Solar Energy Plant Project

Draft Addendum

to the

Environmental Management Programme for the Grid Connection

February 2021

Applicant

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Appendix A: Maps

A1 – Power Line Route Map

A2 – Aquatic constraints (Orange River delineation and buffers)

A3 – Critical Biodiversity Areas Map

A4 – Protected Trees

Appendix B: Gazetted EMPr

Appendix C: Company Profile and condensed Curriculum Vitae of EAPs

CHAPTER 1: BACKGROUND

1.1 Background to the Environmental Authorisation

An Environmental Authorisation (EA) was issued for the construction of the **100MW Douglas Solar Energy Plant and associated infrastructure** on 7 May 2015 with reference number 12/12/20/2512. The EA was subsequently amended on 25 May 2015 with reference number 12/12/20/2512/AM1 and again on 20 April 2018 with reference number 12/12/20/2512AM2. The EA lapses on 7 May 2021 and a Part 1 EA Amendment Application was made to ensure the EA remains valid for the maximum period of 10 years.

1.2 Addendum to the EMPr and Gazetted EMPr

This document forms an addendum to the Environmental Management Programme (prepared by CSIR Environmental Management Services) as submitted with the Final Environmental Impact Assessment Report (EIA Report) in November 2014.

The stipulations herein must be read with **Section 16: Independent Environmental Management Plan for the HV Self-Build Electrical Connection to the Existing Grid** of the 2014 EMPr.

GAZETTED GENERIC ENVIRONMENTAL MANAGEMENT PROGRAMME

On 22 March 2019 a *Generic Environmental Management Programme (EMPr)* was promulgated in terms of Section 24 of NEMA and gazetted as Government Notice No 435. This EMPr is applicable for substations and overhead electricity transmission and distribution infrastructure as identified in terms of

- activity 11 or 47 of EIA Regulations Listing Notice 1 of 2014, as amended, or for
- activity 9 of EIA Regulations Listing Notice 2 of 2014, as amended, and
- any other listed and specified activities necessary for the realisation of such infrastructure.

This Generic EMPr should be applicable to the Douglas Solar Energy Plant's grid connection and therefore it forms part of this addendum to the 2014 EMPr. The gazetted EMPr is attached to this document as Appendix B.

The Generic Environmental Management Programme consists of the following:

1.3 Expertise of Environmental Assessment Practitioners

This Addendum to the EMPr was compiled by Landscape Dynamics Environmental Consultants to include the power line route alternative to the project description of the 100MW Douglas Solar Energy Facility.

Landscape Dynamics is an environmental consultancy firm established in May 1997. The main line of business since that time up to the present is the compilation of environmental impact assessments. Landscape Dynamics has a broad client base from both the private and government sectors which has developed over the past 23 years of professional services supplied. The operating base for Landscape Dynamics is the entire South Africa; with local representation in Gauteng, the North West Province, Mpumalanga, the Western Cape, the Northern Cape and Limpopo. The Environmental Assessment Practitioners (EAPs) for this project are Ms Annelize Grobler and Ms Susanna Nel. Both EAPs are EAPASA registered. *Refer to Addendum C for a Company Profile and condensed Curriculum Vitae's of the EAPs.*

1.4 Grid Connection and Route Map

It was planned that the Douglas Solar Energy Plant would have connected to the Eskom grid via a 132kV power line to the Ovaal Pump Substation which is located approximately 2km east of the eastern border of the Solar PV site. Three route alternatives for the grid connection were investigated during the original EIA process. The previously authorised route is however no longer a viable option because a recent grid study advised that the Douglas 100MW Energy Plant should connect directly to the substation and should not feed into the Disselfontein/Ovaal 1 132kV Overhead Line due to limited capacity on the line. It was therefore required to use one of the other alternatives which were also investigated as part of the EIA process at that time.

A **Part 2 EA Amendment** application was made and it was determined that Route Alternative 2 (as per the map below) should be authorised. This *Addendum to the Environmental Management Programme (EMPr)* provides mitigation measures to minimise the impact Route Alternative 2 could have on the environment and should be read together with the EMPr as submitted with the Environmental Impact Assessment Report, dated November 2014. The report and EMPr was compiled by the CSIR: Environmental Management Services with report reference number CSIR/CAS/EMS/ER/2012/0010/B.

Route Alternative 2 (the green route) is the route recommended for authorisation

Also refer to Appendix A for an A4 copy of this map

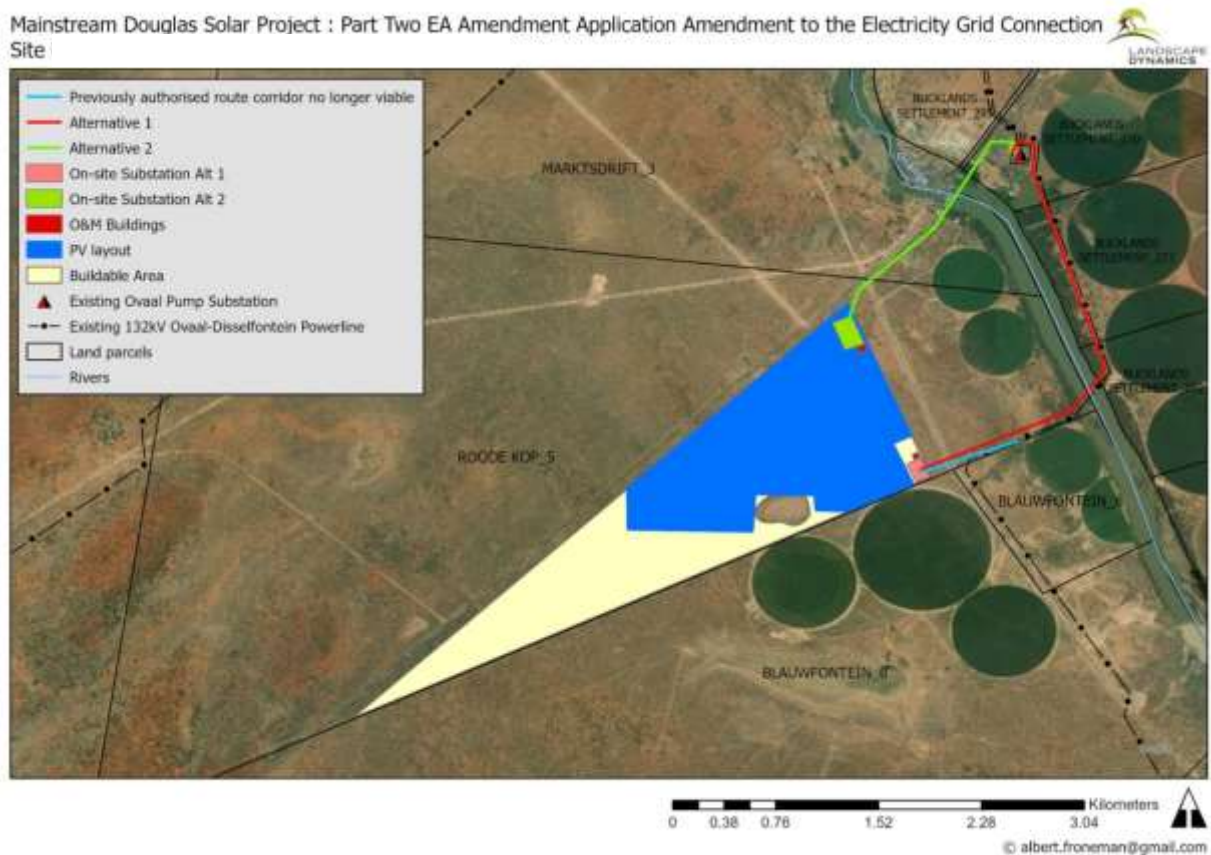


Figure 1: Power Line Route Map

1.5 Project Description

PROJECT COMPONENTS

- 132kV power line
- Substation
- Operations & Maintenance Buildings (O&M Buildings)

The power line is a new 132kV line running parallel to the R357 provincial road (adjacent the existing bridge) with an on-site substation and O&M Buildings located at the north-eastern corner of the proposed Douglas Solar Energy Plant. This route crosses the Orange River before it connects to the Ovaal Substation.

CHAPTER 2: MITIGATION FOR INCLUSION INTO THE EMPr

2.1 Specialist studies: no mitigation required

In the Final EIR of 2014 the route alternatives are discussed under *Section A, Paragraph 3: Project Alternatives*. From the summary in this report, it was clear that no further input would be required in terms of the following:

- **Palaeontology:** An exemption letter was obtained in 2014
- **Soil & Agriculture:** No impact associated with the three route alternatives was identified
- **Visual:** The power line route as presented in this document was assessed and no further mitigation measures are required.
- **Socio-Economic:** The power line route as presented in this document was assessed and no further mitigation measures are required.
- **Heritage:** The power line route as presented in this document was assessed and no further mitigation measures are required.

2.2 Specialist studies: mitigation

2.2.1 Avifauna

Recommendations made to prevent bird collisions and electrocutions in the original Avifauna Impact Assessment (2014) and included in the 2014 EMPr are being replaced with the following:

Table 1: Avifauna Impact and Mitigation Table

Nature of the management activity	Mitigation objectives	Mitigation/Management action	Monitoring		
			Methodology	Frequency	Responsibility
IMPACTS DURING THE DESIGN, CONSTRUCTION and OPERATIONAL PHASES					
Impact on avifauna					
Collision and electrocution of Species of Concern	Maintain the power line and bird infrastructure to minimise collisions and electrocutions	OPERATIONAL PHASE <ul style="list-style-type: none"> The proposed 132kV power line should be marked with Eskom approved Bird Flight Diverters (BFD) or Bird Flappers to lower the risk of avian collisions with the power line for its entire 	Check regularly that BFDs, flappers and vulture friendly structures are in place and in good state.	Monthly	Project Developer, South Africa Mainstream Douglas Solar (Pty) Ltd

		<p>length. The BFDs should be fitted to the earthwire, 5m apart, alternating black and white/yellow on the earthwire. The applicant should request Eskom to mark the existing 5-pole HV line as well to further reduce the collision risk.</p> <ul style="list-style-type: none"> It is strongly recommended that the DT 7649 vulture friendly structure is used for the grid connection as per Appendix 1 of the Avifauna Statement. 		
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2.2.2 Aquatic

This map is also included as Appendix A2.



Figure 2: Aquatic Constraints Map

Table 2: Aquatic Impact and Mitigation Table

Nature of the management activity	Mitigation objectives	Mitigation/Management action	Monitoring		
			Methodology	Frequency	Responsibility
IMPACTS DURING THE DESIGN, CONSTRUCTION and OPERATIONAL PHASES					
Impact on freshwater ecosystems					
Direct disturbance of aquatic habitat and associated impacts to aquatic biota. Potential water quality impacts (mostly during construction) Longer-term maintenance activities also have the potential to result in some disturbance of aquatic habitat	Ensure that pollution of water sources does not take place and effective management actions are in place to protect the water sources during the operational phase.	<p>PLANNING & DESIGN PHASE</p> <ul style="list-style-type: none"> Construction activities should as far as possible take place outside of the delineated aquatic features and the proposed buffer zones. These areas should be marked as no-go areas before construction. Neither the pylons, their anchors nor any access roads to the pylons should be placed within the river channel, riparian zone and the recommended buffer zones if it could be avoided. The overhead powerlines may, however, cross over the buffer zones and the river. 	Final design and pole placement must be overlain on GE maps indicating the buffer zones to ensure pylon placement is outside of sensitive areas wherever possible.	Once off during design	Project Developer, South Africa Mainstream Douglas Solar (Pty) Ltd
		<p>CONSTRUCTION PHASE</p> <ul style="list-style-type: none"> Run-off over any exposed areas on the northern slope, near the substation, should be mitigated to reduce the rate and volume of run-off and prevent erosion. Contaminated runoff from construction should be prevented from entering the river. All materials on the construction site should be properly stored and contained. Construction workers should be given ablution facilities at the construction site that are located outside of the recommended buffer for the river and regularly serviced. As far as possible existing access roads or existing disturbed areas should be 	Activities to be monitored by the ECO in compliance with the EMPr and conditions of the EA	Monthly	Project Developer, South Africa Mainstream Douglas Solar (Pty) Ltd

		<p>utilised to minimise the extent of disturbance in the area. Access roads should be contoured along any steep slope (if applicable). Run-off over the exposed areas should be mitigated to reduce the rate and volume of run-off and prevent erosion.</p> <ul style="list-style-type: none"> • Since the vegetation in the study area is still largely indigenous vegetation with minimal invasive alien plant growth, any of the cleared areas should be rehabilitated after construction is completed. Where necessary, these areas should be re-vegetated with suitable indigenous plants. Any invasive alien plant growth occurring within the immediate area of the construction activities should be removed and any regrowth prevented. • Disposal of waste from the site should also be properly managed. 			
		<p>OPERATIONAL PHASE ACTIVITIES</p> <ul style="list-style-type: none"> • Maintenance of infrastructure related to the project should only take place via a designated access route. • Disturbed areas along the access route should be monitored to ensure that the area does not become subject to erosion or invasive alien plant growth. 	Mainstream must communicate the ecological requirements with the maintenance personnel and monitor compliance	Monthly	Project Developer, South Africa Mainstream Douglas Solar (Pty) Ltd

2.2.3 Vegetation

The study area is on the edge of the Eastern Kalahari Bushveld Bioregion of the Savanna Biome. The Orange River section is classified as a Critical Biodiversity Area (CBA) in the Northern Cape provincial CBA maps.

The conservation status of the Northern Upper Karoo is considered Least Threatened, while the Upper Gariep Alluvial Vegetation is classified as Vulnerable.

Two protected tree species, the Shepherd's Tree *Boscia albitrunca* and the Camel Thorn *Vachellia erioloba*, are scattered throughout the area of the power line route.

The map below is also attached as Appendix A3.



Figure 3: Critical Biodiversity Areas

Table 3: Vegetation Impact and Mitigation Table

Nature of the management activity	Mitigation objectives	Mitigation/Management action	Monitoring		
			Methodology	Frequency	Responsibility
IMPACTS DURING THE DESIGN, CONSTRUCTION and OPERATIONAL PHASES					
Impact on Flora & Terrestrial Fauna					
Destruction of two protected tree species, the Shepherd's tree <i>Boscia albitrunca</i> and the camel thorn <i>Vachellia erioloba</i> , which are found within the power line servitude	Conservation of protected tree species	<p>DESIGN PHASE</p> <ul style="list-style-type: none"> A walk-down of the 100m route corridor should be undertaken by a qualified botanist and all protected trees that could be affected by the construction activities should be clearly marked. The markings should clearly indicate which trees may be removed / trimmed (as per permit requirements) and which trees should be conserved in its totality. All workers on site should be adequately educated and monitored in terms of the importance of the protection of these trees as well as the conditions contained in the protected tree permits. 	Mainstream must appoint a suitable qualified botanist for the walk-down and implement his/her final requirement in the final power line design	Once off during design	Project Developer, South Africa Mainstream Douglas Solar (Pty) Ltd Botanist
		CONSTRUCTION PHASE Impacts and mitigation as per the 2014 EMPr			
Destruction of habitat	Prevent degradation of the natural environment	<p>OPERATIONAL PHASE</p> <ul style="list-style-type: none"> Any invasive alien plants must be immediately controlled, or at least annually before they set seed. An on-going monitoring programme should be implemented to detect and quantify any aliens that may become established and provide information for the management of aliens according to best practice methods for each species. Invasive species will need to be controlled for the life of the project and after closure if still present. 	Mainstream should ensure that appropriate personnel is trained in the identification and removal of alien species	Monthly	Project Developer, South Africa Mainstream Douglas Solar (Pty) Ltd. Botanist

2.3 Permit / License Requirements / Other

2.3.1 Water Use Authorisation

A water use authorisation will be needed from the Department Water & Sanitation for approval of the water use aspects of the power line crossing the Orange River. The proposed power line works within and adjacent to the Orange River is deemed to be changing the characteristics of the associated aquatic ecosystems as well as impeding flow in the watercourses and therefore require authorisation. Section 21 (c) and (i) water uses are therefore applicable.

Considering that the risk of the proposed activities on the aquatic features in the area would be **low to very low**, it is likely that the activities would fall within the ambit of the General Authorisations for this potential water use (change to the bed, banks or characteristics of a watercourse or impeding/diverting the flow in a watercourse).

Application for a GA would therefore have to be made and authorised before construction may commence.

Note: A Water Use Licence Application / General Authorisation would have to be made due to the close vicinity of the solar PV plant to the ephemeral pan. The application for the pan and the power line crossing line crossing the Orange River may be done in one integrated water use authorisation application.

2.3.2 Protected Tree Species

Two protected tree species, the Shepherd's tree *Boscia albitrunca* and the camel thorn *Vachellia erioloba*, are scattered throughout the area of the power line route:

- The total number of protected trees within a 20m route corridor is 8
- The total number of protected trees within a 100m corridor is 16

The map below is also attached as Appendix A4 and an electronic version is available



Figure 4: Protected Trees Map

The **National Forests Act** (Act 84 of 1998) provides for the protection of certain tree species, and a license is required to either remove, cut, disturb, damage or destroy the listed protected trees. The Department of Environment, Fisheries and Forestry issues the required permits.

Northern Cape Nature and Environmental Conservation bill of 2009

According to this Ordinance, no person without a valid permit from the Northern Cape Department of Environment and Nature Conservation may pick, buy, sell, donate, import or export any specially protected and protected plant species. The Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform issue the required permits.

Permits from the Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform and the Department of Environment, Forestry and Fisheries will be required to trim or remove any protected trees along the authorised power line route.

2.3.3 Invasive Alien Species

Two invasive alien species are fairly abundant on sections of the route – Mexican poppy *Argemone ochroleuca* (Category 1b) and Mesquite *Prosopis cf glandulosa* (Category 1b).

The **Conservation of Agricultural Resources Act** (CARA 1983) According to the amended regulations (No. R280) of March 2001 of CARA (1983), declared weeds and invader plants are divided into three categories:

- *Category 1a & b* may not be grown and must be eradicated and controlled,
- *Category 2* may only be grown in an area demarcated for commercial cultivation purposes and for which a permit has been issued, and must be controlled, and
- *Category 3* plants may no longer be planted and existing plants may remain as long as their spread is prevented, except within the flood line of watercourses and wetlands. It is the legal duty of the land user or land owner to control invasive alien plants occurring on the land under their control.

The **National Environmental Management: Biodiversity Act** (NEMBA 2004, chapter 5, sections 73– 75) regulates activities involving invasive species, and lists duty of care as follows:

- The land owner/land user must take steps to control and eradicate the invasive species and prevent their spread, which includes targeting offspring, propagating material and regrowth, in order to prevent the production of offspring, formation of seed, regeneration or re-establishment, take all required steps to prevent or minimise harm to biodiversity, and ensure that actions taken to control/eradicate invasive species must be executed with caution and in a manner that may cause the least possible harm to biodiversity and damage to the environment.

CHAPTER 3: CONCLUSION

The mitigation and permit/license requirements as mentioned in this document include all recommendations made by the specialists appointed for the EA amendment application as made for the Douglas Solar Energy Plant grid connection. The EAPs are confident that this addendum to the 2014 EMPr addresses all identified impacts to acceptable levels and that this document should be accepted as an addendum to the existing (2014) EMPr.
