

**Socio- Economic Impact Assessment of Amended 2017 Solar Energy Facility Daniëlskuil,**  
For  
**Roma Energy Daniëlskuil (Pty) Ltd**  
In support of the Environmental Basic Assessment Report by Enviro Africa, Helderberg.



Reports

Preliminary SEI	March 2012
SEI	May 1012
SEI of Adjusted Proposal	March 2017

## Executive Summary

In 2012 EnviroAfrica cc, was appointed by Roma Energy Daniëlskuil (Pty) Ltd to undertake a Basic Environmental Assessment (BA Report) for a proposed Photovoltaic Energy Generation Facility on a portion of Erf 753 (Portion of Erf 1), Daniëlskuil in accordance with the Environmental Management Act, 1998 (Act no 107 of 1998), as amended and the Environmental Assessment Regulations, 2010. Leap Sustainable Development was appointed to undertake the specialist socio-economic impact assessment as part of the BAR. The reports generated in this round were a Preliminary Socio-economic Impact Assessment and a Socio-economic Impact Assessment.

The Environmental Authorizations granted lapsed and applications have to be made afresh

## Purpose

This report assesses

- a) the amended application to accommodate any changes that may come about since the original assessment and
- b) the cumulative impacts as required by DEAT.

## Approach

The assessment is done by

- a) Comparing development proposals in 2011 – 2012 with development proposals in 2017. The impact of the differences, if any, is then evaluated and mitigation measures are proposed.
- b) Evaluating cumulative impacts as per DEAT's requirements.

## Comparison between 2012 and 2017 proposal

Changes in the receiving environment are tabulated below and can be summarized as follows:

- a) Different technology is used (Crystalline photovoltaic instead of concentrated photovoltaic)
- b) Less energy will be generate (5MW instead of 10 MW)
- c) Downscaling in size of infrastructure

No downscaling in extent of the facility.

## Impacts and Cumulative impacts during the Construction, Operational and Decommissioning Phases:

The significance and intensity of impacts during the **construction phase** stays the same as in 2012 should the proposed mitigation measures be applied.

The significance and intensity during the **operational phase** stays the same as in 2012 should the proposed mitigation measures be applied.

The cumulative impacts of the propose development and four other renewable projects planned have the following results for both the construction and operational phase:

- a) The community will experience positive changes in their economic and material well-being as
  - More job and job opportunities will be generated.
  - Skills levels will increase
  - the local economy will improve (increased sales and contribution to GGP)
- b) The community will experience the following environments to be under stress, but through mitigation the stress can be managed:  
Construction phase:

- The roads as there are more slow moving vehicles using the road (R31).
- Authority and municipal services as the likelihood of incidences and need for engineering services may be more likely.
- Natural environment as increased dust and noise levels will decrease air quality.
- Community resources: archaeological, palaeontological and sense of place.

Sense of Place: This impact is of a temporary nature.

Palaeontologically the current losses of Precambrian fossil heritage can be set against the probable widespread occurrence of stromatolitic beds in the subsurface of the extensive Ghaap Plateau (*i.e.* unique fossil heritage is not highly threatened). Furthermore, mining and other bedrock excavations may provide access for palaeontologists to previously inaccessible stromatolite beds. A premium should be set on the conservation of surface exposures of well-preserved stromatolites since partial surface weathering usefully enhances many of the stromatolitic features for scientific study (*cf* Almond 2015).

#### Operational phase

- Authority and municipal services as the likelihood of fires and theft of livestock and increase in noise levels during decommissioning (although temporary) may be more likely.
  - Community resources: archaeological, palaeontological and sense of place.
- Sense of Place: Changes in quality of living environment

c) The community will experience the following environments to be under stress and mitigation is not obvious:

- The employment sector as more people will migrate into Daniëlskuil looking for work. However, the in-migration of job seekers is a national trend and can be mitigated by enhancing the economy country wide, which is what the proposed development does

#### Conclusion

The impacts of the 2017 Proposal is similar and overall positive after mitigation as proposed in 2011.

The cumulative impacts are positive, or can be mitigated to support the positive impacts. Of note is the cumulative impact of mining on palaeontological resources, whilst cumulative impacts of renewable energy are unlikely. The in-migration of job seekers is a national trend and can be mitigated by enhancing the economy country wide, which is what the proposed development does.

The Northern Cape Economic Potential and Investment Profile, 2012 highlights the energy sector as one of the sectors to enhance the socio-economic circumstances of the Northern Cape. Moreover, the carbon footprint to generate electricity will get reduced.

The proposed development is therefore supported from a socio-economic perspective.



## environmental affairs

Department:  
Environmental Affairs  
REPUBLIC OF SOUTH AFRICA


### DETAILS OF SPECIALIST AND DECLARATION OF INTEREST

File Reference Number:	(For official use only)
NEAS Reference	12/12/20/ or 12/9/11/L
Number: Date Received:	DEA/EIA

Application for integrated environmental authorization and waste management license in terms of the-

- (1) National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2014; and
- (2) National Environmental Management Act: Waste Act, 2008 (Act No. 59 of 2008) and Government Notice 921, 2013

### PROJECT TITLE

<b>Roma Energy Daniëlskuil (Pty) Ltd: Proposed 5MW Photovoltaic Energy Generation Plant</b>
---

Specialist:	Anelia Coetzee		
Contact person:	P.O. Box 488		
Postal address:	Malmesbury		
Postal code:	7299	Cell:	082 3394338
Telephone:		Fax:	022 4871661
E-mail:	022 4824653		
Professional affiliation(s) (if any)	info@leapsd.co.za		

Project Consultant:	EnviroAfrica		
Contact person:	Bernard De Witt		
Postal address:	PO Box 5367		
Postal code:	Helderberg	Cell:	082 4489991
Telephone:	7135	Fax:	086203308
E-mail:			

4.2 The specialist appointed in terms of the Regulations\_

I, Anelia Coetzee declare that –

General declaration:

I act as the independent specialist in this application;  
I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;  
I declare that there are no circumstances that may compromise my objectivity in performing such work;  
I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;  
I will comply with the Act, Regulations and all other applicable legislation;  
I have no, and will not engage in, conflicting interests in the undertaking of the activity;  
I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;  
all the particulars furnished by me in this form are true and correct; and  
I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.

---

Signature of the specialist:

Leap Sustainable Development cc

---

Name of company (if applicable):

23 March 2017

---

Date:

## **Background**

In 2012 EnviroAfrica cc, was appointed by Roma Energy Daniëlskuil (Pty) Ltd to undertake a Basic Environmental Assessment (BA Report) for a proposed Photovoltaic Energy Generation Facility on a portion of Erf 753 (Portion of Erf 1), Daniëlskuil in accordance with the Environmental Management Act, 1998 (Act no 107 of 1998), as amended and the Environmental Assessment Regulations, 2010. Leap Sustainable Development was appointed to undertake the specialist socio-economic impact assessment as part of the BAR. The reports generated in this round were a Preliminary Socio-economic Impact Assessment and a Socio-economic Impact Assessment.

The Environmental Authorizations granted lapsed and applications have to be made afresh

## **Purpose**

This report assesses

- c) the amended application to accommodate any changes that may come about since the original assessment and
- d) the cumulative impacts as required by DEAT.

## **Approach**

The assessment is done by

- c) Comparing development proposals in 2011 – 2012 with development proposals in 2017. The impact of the differences, if any, is then evaluated and mitigation measures are proposed.
- d) Evaluating cumulative impacts as per DEAT's requirements.

## **Amended Proposal (2017)**

Roma Energy Daniëlskuil (Pty) Ltd intends to construct a 5 MW solar photovoltaic (PV) energy generation facility on Erf 753 (Portion of Erf 1), Daniëlskuil, Kgatelopele Local Municipality, Northern Cape. The proposed energy generation facility is situated east of the R31 connecting Daniëlskuil to Douglas and directly east of the existing Idwala limestone mine on the southern outskirts of Daniëlskuil. Erf 753 (Portion of Erf 1) is owned by Idwala Industrial Holdings (Pty) Ltd. The land is zoned Agriculture 1

The proposed development entails the construction of about 18540 PV solar panels with a footprint of less than 20 ha. The PV panels will be mounted on pedestals drilled and set into the ground. Associated infrastructure includes a perimeter access road, single track internal access roads, trenches for underground cables, 2 to 4 transformer pads, a switching station, a maintenance shed, and a temporary construction camp. The Ouplaas 132/22kV substation is situated on site.

## **Comparison between 2012 and 2017 proposal**

Changes in the receiving environment are tabulated below and can be summarized as follows:

- d) Different technology is used (Crystalline photovoltaic instead of concentrated photovoltaic)
  - e) Less energy will be generate (5MW instead of 10 MW)
  - f) Downscaling in size of infrastructure
- No downscaling in extent of the facility.

Elements	2012 Proposal	2017 Proposal	Result
- Technology Type	- concentrated photovoltaic (CPV) - uses Fresnel lenses to concentrate light from sun onto individual PV cells	Solar Photovoltaic, Crystalline PV	Different Technology
- Capacity	- 10MW, - A single solar generator produces $\pm 66$ kV. A number of generators arranged in multiple/ arrays produce 10MW.	5MW, 18540 solar modules, 927 Modules strings (a string constitutes a number of modules connected to a common inverter).	Less (half) energy generated
- Inversion and inverters	- An inverter is used to convert direct current electricity produced into alternating current in order to connect to Eskom grid	3 inverter stations (inverters to keep generation of energy at 5MW or below). A total of 7 central inverters will be used.	None
- Specifications/ Scale & Mass	- CPV panels will be elevated 2m above ground supported by a structure, and track path of the sun during the day for maximum efficiency.	Single axis unit, Elevated $\pm 1.5$ m above ground	Shorter axis, down scaling of size of infrastructure
	- Approximately 1.8ha is required to install 1MW. (Thus 10MW require 20ha)	Extent of the development stays the same.	Smaller take up but extent of the development stays the same
	- Each panel will be approximately 17-22m wide by 12.5m high. When panels are tracking vertically the structure will have a maximum height of approximately 15,64m.	Module: 1.956m x 0.992m Module String: 20 x 1.956m x 0.992m = $\pm 40$ m x $\pm 20$ m Height tracking vertically: $\pm 10.5$ m	Maximum height lower
- Mounting	- CPV panels will be mounted on pedestals drilled and set into the ground.	Same	None
- Preparation of land to assemble stands	- Extensive bedrock excavations are not envisaged, but some vegetation will need to be cleared from the site.	Excavations for footings are 1.5m in diameter	None
- Associated Infrastructure	- Single track internal access roads, trenches for underground cables, transformer pads, a switching station, a maintenance shed, and a temporary construction camp on site (containers will be used as sheds)	A perimeter access road, single track internal access roads, trenches for underground cables, 2 to 4 transformer pads, a switching station, a maintenance shed, and a temporary construction camp	None
- Transmission & Substation	- General: Electricity generated will be fed into the national grid at an Eskom substation: Ouplaas substation	Ouplaas substation is on site	None
- Access	- Site will be accessed from N14, using existing secondary roads. Additional temporary access roads will be established on site.	Site will be accessed from N14.	None
- Location, Ownership, extent	- to be established on 20ha of land on Erf 753 (Portion of Erf1), Daniëlskuil	10h to be established on 20ha of land on Erf 753 (Portion of Erf1), Daniëlskuil owned by Idwala Industrial Holdings (Pty) Ltd, zoned Agriculture 1.	None

- Changes in receiving environment	The area for the proposed PV facility is flat and featureless comprising a mix of old grazing land, bush and grassland vegetation, fairly severely degraded. There are no streams, pans, or natural sources of water on the proposed development site. Several large overhead powerlines feeding into the Ouplaas substation and internal access roads are on site. Surrounding land uses are the Idwala Lime Mine, Daniëlskuil Waste Water Treatment Works (WWTW) north east of the proposed site, and vast tracts of agricultural land.	No changes occurred in receiving environment which impact on the original assessment.	None
------------------------------------	---	---	------

### Impacts and Cumulative impacts during the Construction, Operational and Decommissioning Phases:

#### Summary of impacts during the Construction Phase

The impacts identified in the 2012 assessment, have low levels of significance. Where negative, mitigation could keep the levels of significance low or could reverse the impact to become neutral.

The 2017 proposal (different technology, less energy generate, downscaled infrastructure but development footprint stay the same) is compared and evaluated.

The same is done for the cumulative impacts.

The table below lists all the impacts identified during the construction phase, their significance (low or high) and intensity (positive or negative) before and after mitigation:

Impacts	Related Impact	Preferred Alternative 2011	Preferred Alternative 2011 mitigated	Proposal 2017 (2011 mitigation measures)	Cumulative (within 30km)
More jobs / increase in job opportunities will be generated	- Low skills level may cause an influx of job seekers, some loss of community safety	Low, positive	Low, positive	Low positive	Medium positive (job creation) Medium negative (influx of people)
Increase skills levels (changes in economic and material well-being)	- Skills development, training and capacity building: locals may not benefit as "others" may be employed.	None	Low, positive	Low, positive	Medium, positive
Reduced road safety	- Less than 50 trips per day (stock & workers). - Slow moving vehicles may cause intersection to be less safe - Heavy vehicles may cause deteriorating road surfaces	Low, negative	Neutral	Neutral	Medium Negative
Local resources (i.e. clinic) & services under stress.	- Increased demand for municipal and authority services	Insignificant	Insignificant	Insignificant	Low, negative
Decrease Health and	Dust and noise levels raise	Medium,	Low,	Low,	Low negative



Social Well being		negative	negative	negative	
Increased sales and contribution to GGP		Low, positive	Low, positive	Low, positive	Medium, positive
Community Resources (and tourist attractions) under stress	Archaeological Resources: no archaeological remains were recorded.	Low	Low	Low	Low Four renewable energy (RE) projects planned: Do not impact on archaeological resources.
	Palaeontology Resources: Occurrence of stromatolites and other microbial fossils in Precambrian bedrocks. The fossiliferous Precambrian bedrocks are largely mantled here by superficial sediments (e.g. wind-blown sands) of low palaeontological sensitivity. Good surface exposures of stromatolitic limestone are not present here.	Low	Low	Low	Moderately high Cumulative impacts on fossil stromatolite occurrences within Campbell Rand Subgroup in Daniëlskuil region are likely to be already moderately high due to large-scale mining here. Additional potential losses of fossil heritage posed by construction of Daniëlskuil Roma solar plant are unlikely to be significant.
	Sense of Place Ouplaas Eskom substation, overhead powerlines, service roads, and Waste Water Treatment Works, Idwala Lime Mine adjacent	Temporary, Low		Temporary, Low	Temporary, Medium

The significance and intensity of impacts during the construction phase stays the same as in 2012 should the proposed mitigation measures be applied.

The cumulative impacts of the propose development and four other renewable projects planned have the following results:

- d) The community will experience positive changes in their economic and material well-being as
  - More job and job opportunities will be generated.
  - Skills levels will increase
  - the local economy will improve (increased sales and contribution to GGP)
- e) The community will experience the following environments to be under stress, but through mitigation the stress can be managed:
  - The roads as there are more slow moving vehicles using the road (R31).
  - Authority and municipal services as the likelihood of incidences and need for engineering services may be more likely.
  - Natural environment as increased dust and noise levels will decrease air quality.
  - Community resources: archaeological, palaeontolgical and sense of place.  
Sense of Place: This impact is of a temporary nature.

Palaeontologically the current losses of Precambrian fossil heritage, due to mining can be set against the probable widespread occurrence of stromatolitic beds in the subsurface of the extensive Ghaap Plateau (*i.e.* unique fossil heritage is not highly threatened). Furthermore, mining and other bedrock excavations may provide access for palaeontologists to previously inaccessible stromatolite beds. A premium should be set on the conservation of surface exposures of well-preserved stromatolites since partial surface weathering usefully enhances many of the stromatolitic features for scientific study (*cf* Almond 2015).

- f) The community will experience the following environments to be under stress and mitigation is not obvious:
- The employment sector as more people will migrate into Daniëlskuil looking for work. However, the immigration of job seekers is a national trend and can be mitigated by enhancing the economy country wide, which is what the proposed development does.

### Operations and Demolition

The impacts identified in the 2012 assessment, have low levels of significance. Where negative, mitigation could keep the levels of significance low or could reverse the impact to become neutral.

The 2017 proposal (different technology, less energy generate, downscaled infrastructure but development footprint stay the same) is compared and evaluated.

The same is done for the cumulative impacts.

The table below lists all the impacts identified during the construction phase, their significance (low or high) and intensity (positive or negative) before and after mitigation:

Impacts		Preferred Alternative 2011	Preferred Alternative 2011 mitigated	Proposal 2017 (2011 mitigation measures)	Cumulative
More jobs / job opportunities will be generated	- Jobs will be created (specifically security services)	Low, positive	Medium, positive	Medium, positive	Medium, positive Medium negative (influx)
Increased skills levels (changes in economic and material well-being)	- Skills development training and capacity building in cleaning & maintenance	Low, positive	Medium, positive	Medium, positive	Medium, positive
Reduced road safety	- Increased traffic below threshold of 50 trips per day (security & maintenance).	Low, negative	Neutral, insignificant	Neutral, Insignificant	Neutral, insignificant
Decrease health & social well-being	- Fire hazard - Livestock get stolen (perception security staff steal live stock) - Noise during decommissioning: short term, safety as per international standards.	Low, negative	Low, negative	Low, negative	Low, negative
Increased sales and contribution to GGP		Low, positive	Low, positive	Low, positive	Medium positive
Sense of place change (changes in quality of living environment)	- Visual landscape and environment will change	Low, negative	Low, negative	Low, negative	Low, negative (Four renewable energy projects)

	- Ouplaas Eskom substation, overhead powerlines, service roads, and Waste Water Treatment Works, Idwala Lime Mine adjacent				planned)
Enhanced tourism causing changes in economic and material well being	Palaeontology Resources: Occurrence of stromatolites and other microbial fossils in Precambrian bedrocks. Good surface exposures of stromatolitic limestone are not present here	Low	Low	Low	Cumulative impacts on fossil stromatolite occurrences within Campbell Rand Subgroup in Daniëlskuil region are likely to be already moderately high due to large-scale mining here

The significance and intensity during the operational phase stays the same as in 2012 should the proposed mitigation measures be applied.

The cumulative impacts of the propose development and four other renewable projects planned have the following results:

- g) The community will experience positive changes in their economic and material well-being as
  - More job and job opportunities will be generated.
  - Skills levels will increase
  - the local economy will improve (increased sales and contribution to GGP
- h) The community will experience the following environments to be under stress, but through mitigation the stress can be managed:
  - Authority and municipal services as the likelihood of fires and theft of livestock and increase in noise levels during decommissioning (although temporary) may be more likely.
  - Community resources: archaeological, palaeontoligical and sense of place.  
**Sense of Place: Changes in quality of living environment**
- i) The community will experience the following environments to be under stress and mitigation is not obvious:
  - The employment sector as more people will migrate into Daniëlskuil looking for work. However, the in-migration of job seekers is a national trend and can be mitigated by enhancing the economy country wide, which is what the proposed development does.

## Conclusion

The impacts of the 2017 Proposal is similar and overall positive after mitigation as proposed in 2011.

The cumulative impacts are positive, or can be mitigated to support the positive impacts. Of note is the cumulative impact of mining on palaeontological resources, whilst cumulative impacts of renewable energy are unlikely. The in-migration of job

seekers is a national trend and can be mitigated by enhancing the economy country wide, which is what the proposed development does.

The Northern Cape Economic Potential and Investment Profile, 2012 highlights the energy sector as one of the sectors to enhance the socio-economic circumstances of the Northern Cape. Moreover, the carbon footprint to generate electricity will get reduced.

The proposed development is therefore supported from a socio-economic perspective.

## **References**

Almond, J.E. 2017: Recommended exemption from further palaeontological studies & mitigation: Proposed Daniëlskuil Roma Energy Solar Plan, Kgatelopele Local Municipality, Northern Cape

ACRM, 2017: Archaeological Impact Assessment: The proposed Roma Energy Daniëlskuil Solar Energy Farm on Erf 753 (Portion of Erf 1), Daniëlskuil, Northern Cape.

**Goestratics, 2017:**