FINAL AMENDMENT ASSESSMENT REPORT

for

AMENDMENT OF THE ENVIRONMENTAL AUTHORISATION FOR BLOEMSMOND 3 TO INCLUDE BATTERY ENERGY STORAGE SYSTEM

on Portion 5 and Portion 14 of the Farm Bloemsmond 455

In terms of the

National Environmental Management Act (Act No. 107 of 1998, as amended) & 2014 Environmental Impact Regulations

Prepared for Applicant: Bloemsmond Solar 3 (Pty) Ltd.

Date: 23 October 2020

Author of Report: Dale Holder

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Report Reference: KAI582/29

Department Reference: 14/12/16/3/3/1/2042/AM1

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DOCUMENT TRACKING

DOCUMENT HISTORY

REVISION	DATE	AUTHOR
Draft Amendmend Assessment Report	02 September 2020	Dale Holder
Final Amendment Assessment Report	23 October 2020	Dale Holder
Draft Addendum to Environmental Management Programme	02 September 2020	Dale Holder
Final Addendum to Environmental Management Programme	23 October 2020	Dale Holder

APPROVAL FOR RELEASE

NAME	TITLE	SIGNATURE
Dale Holder	Senior Environmental Practitioner	

DISTRIBUTION

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SUBMISSION AND CORRESPONDENCE

SUBMISSION / CORRESPONDENCE	DATE
Application for amendment of EA submitted	11 August 2020
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Draft Amendment Assessment Report acknowledged	07 September 2020
Comment on Draft Amendment Assessment Report from competent authority	02 October 2020
Final Amendment Asssment t Report submitted for decision making	23 October 2020

APPOINTED ENVIRONMENTAL ASSESSMENT PRACTITIONER:
Cape EAPrac Environmental Assessment Practitioners PO Box 2070 George 6530 Tel: 044-874 0365 Fax: 044-874 0432 **Report written & compiled by:** Dale Holder (Ndip Nature Conservation), who has over 15 years' experience as an environmental practitioner. **Registrations:** Director, Louise-Mari van Zyl (MA Geography & Environmental Science [US]; Registered Environmental Assessment Practitioner with the Interim Certification Board for Environmental Assessment Practitioners of South Africa, EAPSA). Ms van Zyl has over fifteen years' experience as an environmental practitioner.

PURPOSE OF THIS REPORT:
DEFF Decision Making

APPLICANT:
Bloemsmond Solar 3 (Pty) Ltd

CAPE EAPRAC REFERENCE NO:
KAI582/29

DEPARTMENT REFERENCE:
14/12/16/3/3/1/2042

SUBMISSION DATE:
23 October 2020

Final Amendment Assessment Report

in terms of the

National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended) & Environmental Impact Regulations2014 (as amended)

Bloemsmond 3

Portion 5 and Portion 14 of the Farm Bloemsmond 455.

Submitted for:

Departmental Review

Report Issued by:

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REPORT DETAILS

Title:	Final Amendment Assessment Report for Bloemsmond 3
Purpose of this report:	The purpose of this amendment assessment report is to provide details on the proposed amendments to the EA and to assess the impacts associated with these amendments on the receiving environment. The Draft Amendment Assessment Report was available to all registered and potential interested and affected parties for a 30 day review and comment period extending from 03 September 2020 – 05 October 2020 All comments received during this comment period have been incorporated into a Final Amendment Assessment report that is herewith submitted to the DEFF for decision making.
Prepared for:	Bloemsmond Solar 3 (Pty) Ltd
Published by:	Cape Environmental Assessment Practitioners (Pty) Ltd. (Cape EAPrac)
Authors:	Mr Dale Holder
Reviewed by:	Ms Melissa Mackay
Cape EAPrac Ref:	KAI582/29
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Date:	23 October 2020
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TECHNICAL SUMMARY OF PROPOSED AMENDMENT

This section provided summary of the technical details of the proposed amendments[1].

Size of BESS	Up to 500 Megawatt Hours
Height of BESS	±3 metres
Technology	Lithium Battery Technologies

Situated at:

	Latitude	**Longitude**
North West	28° 33' 22.8"	21° 01' 46.8"
North East	28° 33' 22.7"	21° 01' 52.6"
South West	28° 33' 32.2"	21° 01' 52.3"
South East	28° 33' 29.8"	21° 01' 57.8"

DEFF COMMENT ON AMENDMENT ASSESSMENT REPORT

The competent authority provided comment on the draft amendment assessment report. A copy of this comment is included in appendix E5. This comment and the responses thereto are detailed below.

Comment	**Response**
(a) Alternatives	Lithium battery alternatives were identified as the preferred alternative in the Technical Document attached in Appendix E11.

[1] These only include the details where the amendments will result in physical changes to the Authorisation, namely the addition of a BESS within the authorised footprint.

Comment	Response
Please provide the description of any identified alternatives for the proposed activity (battery Storage facility) that are feasible and reasonable, including the advantages and disadvantages that the proposed activity will have on the environment and on the community that may be affected by the activity as per the requirements of GNR.982 of 2014. Alternatively, you should submit written proof of an investigation and motivation. If no reasonable or feasible alternatives exist, the motivation for not considering such must be provided.	In this document, conventional storage systems like pumped hydro and other battery technologies (zinc hybrid cathode, sodium ion, sodium sulphur, lead acid and flow batteries) were considered by the applicant. Lithium technology batteries were considered to be the most feasible due to the following reasons (as detailed in Appendix E11): 1. Flexible in terms of location and sizing (compared to conventional storage technologies such as pumped hydro); 2. High energy density (compared to other battery technologies); 3. Lightweight; and 4. Lower Environmental Risk than other battery technologies (most notably the very low risk of electrolyte leakage) For the reasons above, lithium battery technology was determined to be the most feasible storage technology identified and was assessed accordingly. The need and desirability for energy storage to be included in PV energy developments is discussed in section 3 of the Amendment Assessment Report. The general advantages and disadvantages of the proposed amendment are as follows: **Advantages** Inclusion of BESS within the authorised footprint will allow for the PV facility to provide energy into the National Grid outside of sunlight hours and as such will be able to provide stored energy during peak times when traditional PV is not available. This will eliminate the need to construct additional non-renewable energy generation facilities to provide energy to the national grid during these peak times. **Disadvantages** None envisioned. All of the participating specialists confirmed that the addition of the BESS within the authorised project footprint would not likely increase the level or nature of the impacts previously assessed in any meaningful way.
(b) Public Participation Process The following must be submitted with the Final Amendment Report: - A List of Registered Interested and Affected Parties as per regulation 42 of the NEMA EIA Regulations, 2014 as amended; - Copies of comments received during the draft Amendment comment period; and	- An I&AP register in compliance with Regulation 42 is attached in Appendix F1. - Copies of all comments received are attached in Appendix F5. - This comments and responses report is attached in Appendix F2 (i.e. this document, which includes the Departments comment) - All comments received from State Departments, including those received from the Departments

Comment	Response
- A comments and responses report and responses report which contains all comments received and responses provided to all comments and issues raised during the public participation process. Please note that the comments received from the Department must also form part of the comment and response report. - Please ensure that all issues raised and comments received during the circulation of the draft Amendment Report from registered I&AP's and organs of state which have jurisdiction (including the departments biodiversity sector) in respect of the proposed activity are adequately addressed. - Proof of correspondence of with the various stakeholders must be included in the final amendment report. Should you be unable to unable to obtain comments, proof of the attempts that were made to obtain comments. The public participation must be conducted in terms of Regulation 39, 40, 41, 42, 43 and 44 of the EIA regulations 2014 as amended.	Biodiversity directorate have been included and addressed. Please refer to Appendix F2 and F5. - The proof the attempts to obtain comments are included in Appendix F3. Kindly note that in terms of regulation 32(1)(aa), the public participation in respect of a part 2 amendment must be undertaken to a level as agreed upon with the competent authority. The mechanism for this was via the submission and approval of a public participation plan. The public participation for this application was therefore undertaken in compliance with the approved public participation plan & regulation 32(1)(aa) and not in compliance with regulation 39 – 44.
(c) Environmental Management Programme The Amended EMPr must include the following: - All recommendations and mitigation measures recorded in the Amendment Report and the Specialist Studies conducted. - An Environmental Sensitivity map indicating the environmental sensitive features identified during the assessment process. - Measures to protect hydrological features such as streams, rivers, pans, wetlands, dams and their catchments and other environmentally sensitive areas from construction impacts including the direct or indirect spillage of pollutants - The amended EMPr must include a detailed fire management and protection plan. - In addition to the above, the amended EMPr must comply with Appendix 4 of the EIA regulations 2014, as amended.	- The recommendations and mitigations measures recorded in the amendment assessment report and specialist studies are summarised in section 13 of the Amended EMPr. - The participating specialists did not identify any additional sensitive features within the scope of the proposed amendments. The sensitive features identified in the previous EIA process and there proximity to the proposed BESS are shown in Appendix D of the amendment assessment report and Appendix A of the Amended EMPr. - Measures to protect hydrological resources from potential pollutants are included in sections 5.11 of the Amended EMPr. - A fire management and protection plan is included in section 5.23 of the amended EMPr. - Please refer to the checklist on page 1-3 of the amended EMPr, where compliance appendix 4 of the EIA regulations 2014 is summarised.
(d) Specialist declarations and undertaking under oath. The final amendment report must include the specialist declarations of interest of all specialists who were commissioned for the amendment process and these must be submitted in the departments template.	These specialists' declarations on the Departments most recent template have been added to the Final Amendment Assessment Report in Appendix L.
(e) EAP Declaration of Interest and undertaking under oath The submitted amendment report has included the EAP's declaration which was taken from the application for amendment of environmental authorisations. Please note that for the submission of any report to the Department, there is a Departments template for Declaration of the EAP which is inclusive of an undertaking under oath. You are therefore requested to submit the EAP's declaration in the correct template and this template can be obtained from the departments website.	The EAPs declaration form dated 01 September 2018 as extracted from the Departments website on 09 October 2020 has been included in the Final Amendment Assessment Report in Appendix M.

Comment	Response
(f) Coordinates. Please ensure that the final Amendment reports includes corner coordinates of the proposed battery storage facility.	The corner coordinates of the proposed BESS area have been tabulated on page ii of the Final Amendment Assessment report.
(g) General - Please ensure that all mitigation recommendations are in line with applicable and most recent guidelines. - The draft amended EMPr and Final Facility layout map must be updated to include and incorporate all mitigation measures recommended by the specialists. - The applicant is required to comply with Regulation 39 (1) of the EIA regulations 2014 and submit a written consent of the landowners for the amendment application. - The EAP is to ensure that all the amendments applied for do not trigger any listed activity as outlined in Regulation 31 of the EIA regulations, 2014 as amended. - The final motivation report must include specialist input into a risk assessment for the Battery Energy Storage System and updates to the EMPr to address these additional risks.	- The mitigations included in the amendment assessment report and the amended EMPr are applicable to the scope of the proposed amendments only and are in line with the most recent guidelines. The mitigations applicable to the facility as a whole are included in the original EA and EMPr and remain applicable to the development of the facility as a whole (these have not been reiterated as part of this application for amendment). - The amended EMPr includes the specialist mitigation measures in section 13. The nature of the mitigations are such, that they cannot be spatially displayed. The only participating specialist that identified additional mitigations applicable to the BESS was the Freshwater Ecologist and this has been incorporated into the Assessment report, Risk assessment and the Amended EMPr. The remaining specialists confirmed that the mitigations detailed in the original studies remain in force. - A consent from the landowner, Mr Willie Snyman of MMWS Boerdery (Pty) Ltd is attached in Appendix 4 of the application form. It has also been appended to Appendix N of the Final Amendment Assessment Report. - It is confirmed that the proposed BESS does not trigger any new listed activities that were not previously assessed and authorised. The rational for this statement is included in section 2 of Appendix 11 (technical design report) - The risk assessment which includes any additional mitigation measures provided by the specialists is attached in Appendix G of the Amendment Assessment Report as well as in Appendix D of the Amended EMPr.

ORDER OF REPORT

Final Amendment Assessment Report – Main Report

Appendix A	:	Location, Topographical Plans (Cape EAPrac, 2019)
Appendix B	:	Biodiversity Overlays (Cape EAPrac, 2019)
Appendix C	:	Site Photographs (Cape EAPrac, 2019)
Appendix D	:	Solar Facility Layout Plans incorporating the BESS (Bloemsmond Solar 3 (Pty) Ltd)
Appendix E	:	Specialist Statements and Technical Reports
Annexure E1	:	Ecological Impact Statement (Terrestrial and Avifaunal) (Confluent, Enviro-insite 2020)
Annexure E2	:	Freshwater Ecological Impact Statement Confluent, 2020)
Annexure E3	:	Agricultural Impact Statement (Lubbe, 2020)
Annexure E4	:	Archaeology Impact Statement (van der Walt, 2020)
Annexure E5	:	Palaeontology Impact Statement (Almond, 2020)
Annexure E6	:	Visual Impact Statement (Stead, 2020)
Annexure E7	:	Social Impact Statement (Barbour, 2020)
Annexure E8	:	Traffic and Transportation Statement (JG Africa, 2020)
Annexure E9	:	Stormwater Management Plan (SRK, 2019)
Annexure E10	:	Battery Energy Storage Technical Report (Bloemsmiond Solar 3 (Pty) Ltd, 2020)
Appendix F	:	Public Participation Process
Annexure F1	:	I&AP Register
Annexure F2	:	Comments and Response Report.
Annexure F3	:	Copy of Advert
Annexure F4	:	Draft Amendment Assessment Report Notifications.
Annexure F5	:	Draft Amendment Assessment Report Comments and Responses.
Annexure F6	:	Approved Public Participation Plan
Annexure F8	:	Approval of Public Participation Plan
Annexure G	:	BESS Risk Assessment
Appendix I	:	Addendum to EMPr for BESS
Appendix J	:	Application for the amendment of the EA

Appendix K	:	Application for the amendment of the EMPr
Appendix L	:	Specialist Declarations of interest
Appendix M	:	EAP Declaration
Appendix N	:	Landowner Consent

TABLE OF CONTENTS

FIGURES

TABLES

FINAL AMENDMENT ASSESSENT REPORT

1 INTRODUCTION

Cape EAPrac has been appointed by Bloemsmond Solar 3 (Pty) Ltd, hereafter referred to as the Applicant, as the independent Environmental Assessment Practitioner (EAP), to facilitate an application for an amendment of the project's Environmental Authorisation (EA) and Environmental Management Programme (EMPr), in terms of the National Environmental Management Act (NEMA, Act 107 of 1998), for the authorised 'Bloemsmond 3' solar photovoltaic (PV) facility near Upington and Keimoes in the Northern Cape Province of South Africa.

The total authorised generation capacity of Bloemsmond 3 is up to 100 Megawatts (MW). The applicant intends amending the EA and EMPr to provide for an up to 500 Megawatt Hour (MWh) Battery Energy Storage Systemm (BESS) within the authorised footprint of the facility.

The purpose of this **Amendment Assessment Report** is to describe the environment to be affected by the proposed BESS and to identify and assess any resulting impacts that may result from the addition of a 500MWh BESS.

The Draft Amendment Assessment Report along with all the the supplementary appendices was made available to all registered and potential Interested and Affected Parties (I&AP's) for a 30 day comment period extending from 03 September 2020 – 05 October 2020.

All comments received on the Draft Amendment Assessment Report have been considered, addressed and incorporated into a Final Amendment Assessment Report herewith submitted to the DEFF for consideration and decision making.

1.1 PROPOSED AMENDMENTS

The applicant wishes to amend the EA to include an up to 500 MWh BESS within the authorised footprint of the Facility. In order to affect this proposal, the following amendments to the Environmental Authorisation will be required.

Table 1: Proposed amendments to the Environmental Authorisation for Bloemsmond 3.

Amendment 1: Amendment to Activity Description
The EA of 08 November 2019 has the following description (page 1):
The development of 100MW Bloemsmond 3 Photovoltaic Solar Facility on Portion 5 and Portion 14 Farm Bloemsmond 455 within Kai! Garib Local Municipality in the Northern Cape Province
This should be amended to:
The development of 100MW Bloemsmond 3 Photovoltaic Solar Facility with a Battery Energy Storage System of up to 500MWh on Portion 5 and 14 of Farm Bloemsmond 455 within the Kai! Garib Local Municipality in the Northern Cape Province.
Amendment 2: Change to the project description of the activity
The EA of 08 November 2019 has the following description (page 6):
- for the proposed development of 100MW Bloemsmond 3 Photovoltaic Solar Facility on portion 5 and por 14 of farm Bloemsmond 455 within Kai! Garib Local Municipality in the Northern Cape Province, herea referred to as "the property".

This should be amended to:

"-for the proposed development of 100MW Bloemsmond 3 Photovoltaic Solar Facility with a Battery Energy Storage System of up to 500MWh on Portion 5 and 14 of Farm Bloemsmond 455, within Kai !Garib Local Municipality in the Northern Cape Province, hereafter referred to as "the property".

Amendment 3: Change to the bulleted description of the activity

The EA of 08 November 2019 has the following bulleted description (page 6):

The PV energy facility is to consist of solar photovoltaic (PV) technology, fixed-tilt-, single-axis tracking- or dual-axis tracking- mounting structures, with a net generating capacity of 100 MW as well as associated infrastructure, which will include:

- On-site switching-station / substation;
- Auxiliary buildings (gate-house and security, control centre, office, warehouse, canteen & visitors centre, staff lockers etc.);
- Inverter-stations, transformers and internal electrical reticulation (underground cabling);
- Access and internal road network;
- Laydown area;
- Bloemsmond 3 will connect from the on-site substation to the Upington MTS via the Bloemsmond collector substation (this basic assessment process only includes the IPP portion of the on-site substation, while the remainder of the grid connection is being assessed as part of a separate basic assessment process).
- Rainwater tanks; and
- Perimeter fencing and security infrastructure.

This should be amended to include:

- ….
- Perimeter fencing and security infrastructure; and
- A Battery Energy Storage System of up to 500MWh.

Amendment 4: Change to the planned infrastructure table

The EA of 08 November 2019 has the following description of the Development Footprint in the planned infrastructure table (page 7):

Development Footprint	Approximately 310ha, (This includes the total footprint of PV pane auxiliary buildings, onsite substation, inverter stations and inter roads.).

This should be amended to:

Approximately 310ha (This includes the total footprint of PV panels, a Battery Energy Storage System of up to 500MWh, auxiliary buildings, onsite substation, inverter stations and internal roads).

Amendment 5: Change to Condition 1

The EA of 08 November 2019 has the following description for Condition 1 (page 8):

1. The proposed development of 100MW Bloemsmond 3 Photovoltaic Solar Facility on portion 5 and port 14 of farm Bloemsmond 455 within Kai! Garib Local Municipality in the Northern Cape Province is here approved as per the geographic coordinates indicated above.
This should be amended to:
The proposed development of 100MW Bloemsmond 3 Photovoltaic Solar Facility with a Battery Energy Storage System of up to 500MWh on Portion 5 and Portion 14 of Farm Bloemsmond 455, within Kai !Garib Local Municipality in the Northern Cape Province is hereby approved as per the geographic coordinates indicated above.
Amendment 6: Change to Condition 12
The EA of 08 November 2019 has the following description for Condition 1 (page 8):
12. A final site layout plan submitted as part of the BAR dated 09 September 2019 is hereby approve
This should be amended to:
A revised final site layout plan which includes the Battery Energy Storage System submitted as part of the Amendment Application, is hereby approved.

1.2 RECOMMENDATION OF THIS ASSESSMENT REPORT

Based on the outcomes of this assessment (which includes input from the participating specialists), as well as the outcome of the risk assessment, it is Cape EAPrac's reasoned opinion that the application for amendment of the Environmental Authorisation be granted, subject to the following conditions:

1. That the BESS Addendum to the EMPr be adopted and implemented for the life cycle of the project;
2. That the additional mitigation measures detailed in section 7 of this assessment report be adopted and implemented; and
3. That the additional mitigation measures identified in the Risk Assessment be implemented.

2. OVERVIEW OF THE PROPOSED ACTIVITY AFFECTED BY THE AMENDMENT.

As noted above, the amendment relates to the inclusion of a BESS within the authorised footprint. A BESS technical document is included in Appendix E14, from which the following overview of the project is summarised.

2.1 TECHNOLOGY

Unlike conventional energy storage facilities, such as pumped hydro, a BESS has the advantage of being flexible in terms of site location and sizing. Therefore, they can be incorporated into, and placed in close proximity, to a wind or solar facility. They also have the advantage of being easily scaled and designed to meet specific demands.

Different BESS technologies, such as lithium-ion (Li-ion), zinc hybrid cathode, sodium ion, flow (e.g. zinc iron or zinc bromine), sodium sulphur (NaS), zinc air and lead acid batteries, can be used for grid applications. Compared to other battery options, Li-ion batteries are highly efficient, have a high energy density and are lightweight. As a result of the declining costs, Li-ion technology now accounts for more than 90% of battery storage additions globally (IRENA, 2019).

Therefore, in line with the above, it is proposed that Lithium Battery Technologies, such as Lithium Iron Phosphate (LFP) or Lithium Nickel Manganese Cobalt oxides (NCM), be considered as the preferred technology in this amendment process.

Figure 1: Tesla's Megapack Li-ion Battery (Modular System).

2.2 SIZE OF THE BATTERY

It is assumed that the facility will be required to provide stored energy for up to 5 hours per day at contracted capacity. Considering that the Bloemsmond 3 PV Facility has an authorised total generation capacity (contracted capacity) of 100MW, an up to 500 MWh ($100MW_{AC}$ x 5 hours) battery is proposed. The RMIPPPP requires the plant to be dispatchable between 5am and 9h30pm, so it may need to be able to operate for > 5 hours, but < 100% of Contracted Capacity.

2.3 LOCATION AND SIZE OF THE BATTERY STORAGE AREA

The battery storage facility will be constructed within the authorised footprint, adjacent to the on-site substation, as per the figure below (please also refer to the full scale layout plans attached in Appendix Appendix D).

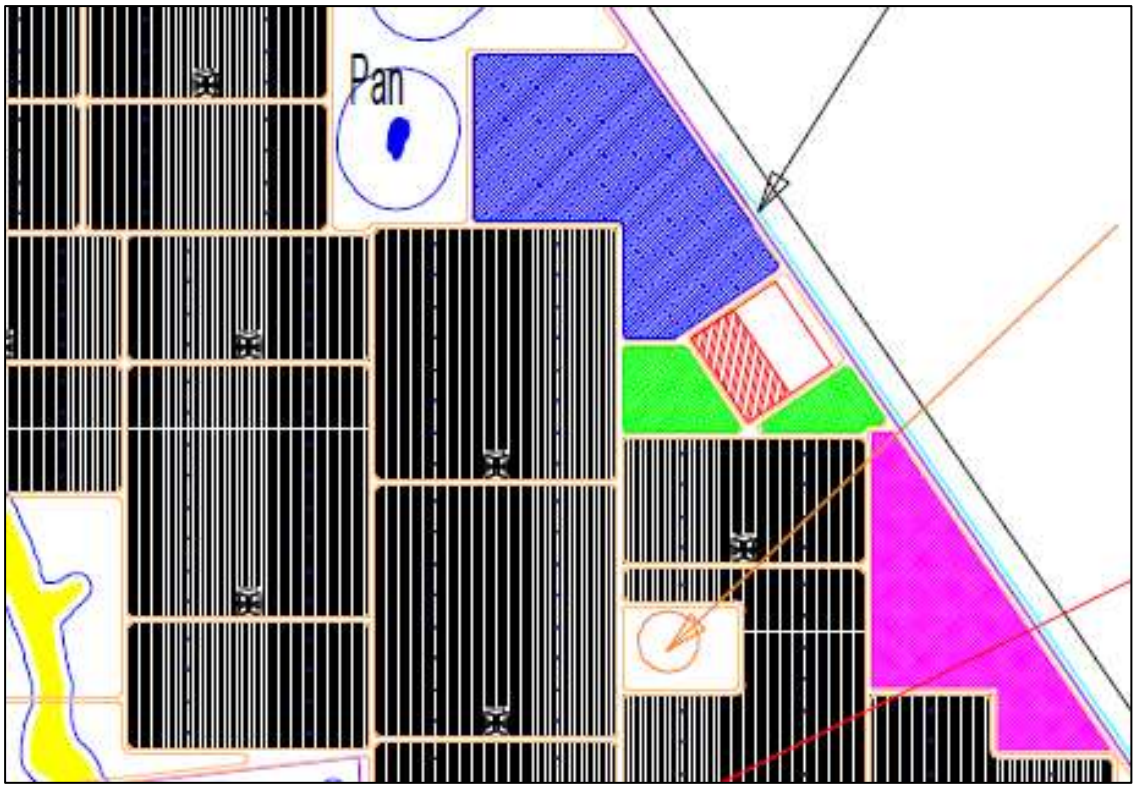


Figure 2: Excerpt of Site Layout plan, showing the proposed position of the BESS (blue polygon) within the authorised footprint.

2.4 GENERAL COMPONENTS

The exact design will depend on the manufacturer, however traditional utility-scale Li-ion battery storage facilities include the following main components:

1. Battery cells → modules → packs → racking system (DC).
2. Storage container (HVAC system, thermal management, monitors and controls, fire suppression, switchgear, and energy management system).
3. Power conversion system (bidirectional inverter to convert AC to DC for battery charging and DC to AC for discharging).
4. Transformer (to step up 480-V inverter output to 12–66 kV).

The figures below illustrates the components that generally make up the primary battery system,

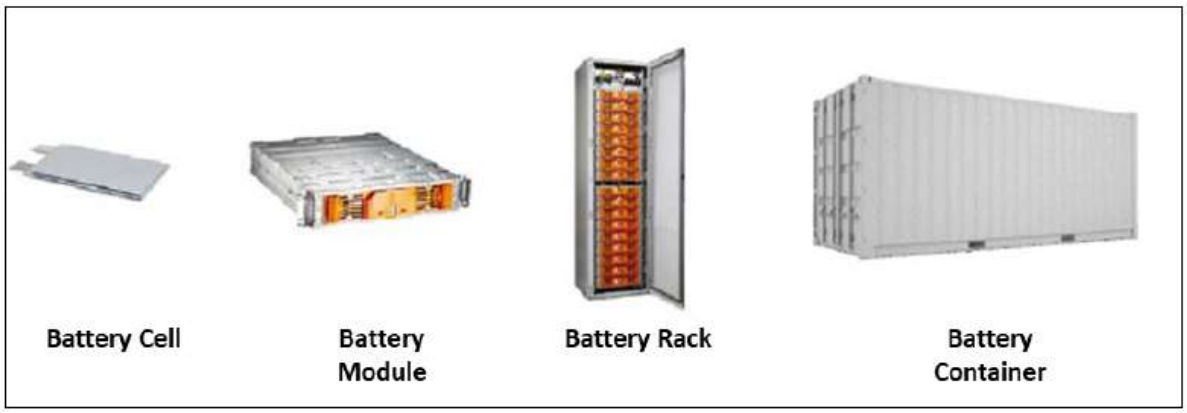


Figure 3: Typical Battery System Components.

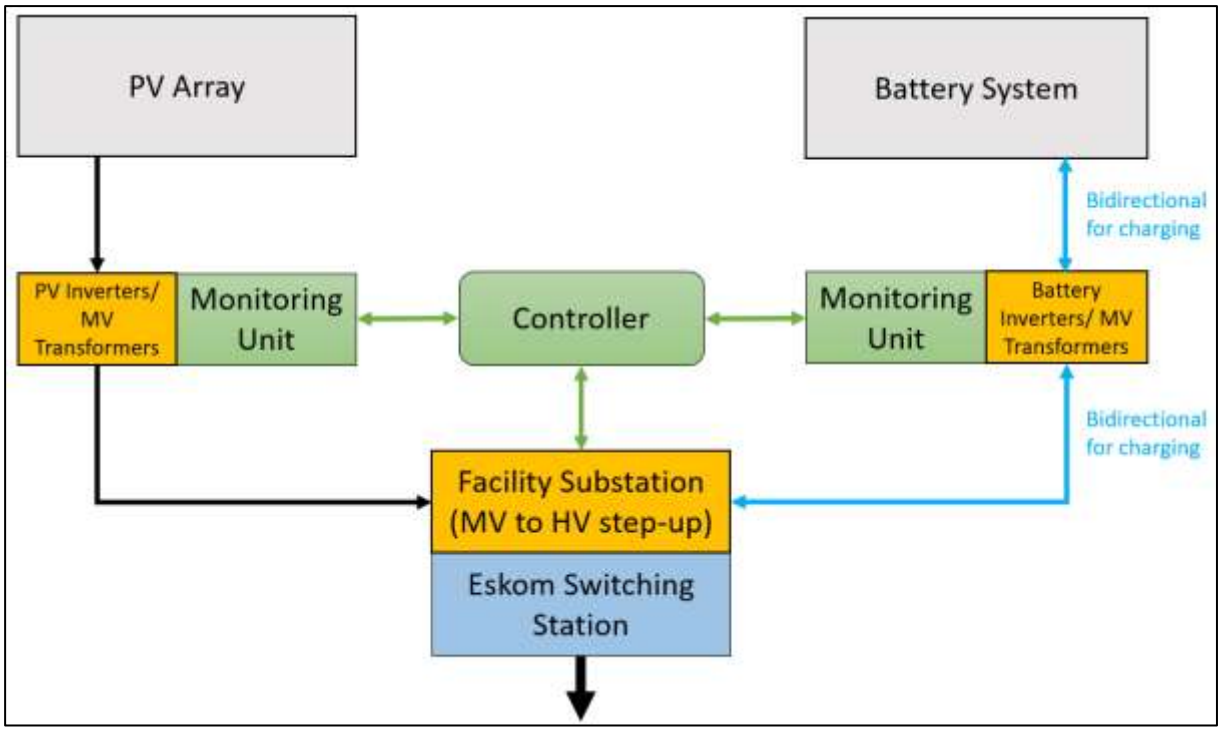


Figure 4: Typical flow diagram of PV plant with battery storage

Figure 5: Example of a typical Battery Energy Storage System - Pivot Power's proposed 50MW lithium-ion battery in Kemsley, Kent.

3. PROJECT NEED AND DESIRABILITY

The need and desirability of the total project considered in the previous environmental process will remaindoes.

South Africa has recognised the need to expand electricity generation capacity within the country. This is based on national policy and informed by ongoing planning undertaken by the Department of Energy (DoE) and the National Energy Regulator of South Africa (NERSA).

In recent years, recurring large-scale power cuts (i.e. load shedding) have highlighted the need to improve reliability and resilience of electricity supply.

One of the main challenges faced by Eskom is managing and balancing electricity demand and supply. While renewable sources can now achieve lower costs than fossil fuels, photovoltaic (PV) arrays and wind turbines both have variable electricity production, since they rely on energy inputs that cannot be controlled (i.e. sunshine and wind). For this reason, fossil fuels currently still have a key role in the energy sector as they can provide electricity on demand and when consumption reaches its peak.

However, cost reductions of energy storage technologies and the wider deployment of battery (particularly lithium-ion) installations globally, now provides an opportunity to combine renewable energy generation with energy storage to provide dispatchable energy (i.e. energy on demand) and reliable capacity.

3.1 SITE SELECTION PROCESS

The site and footprint selection process was considered in detail during the previous environmental Assessment Process. The site and footprint position have been authorised and therefore the scope of the amendments are restricted to utilise the same spatial scale as the authorised project.

3.2 PROJECT PROGRAMME AND TIMELINES

The intention of the applicant is to bid the amended project under the Risk Mitigation Independent Power Producer Procurement Programme (RMIPPPP) or otherwise the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP).

Table 2: Preliminary implementation schedule.

	Description	Timeline
1	RFP Release	24 August 2020
2	BID Submission	24 November 2020
3	Preferred Bidder Announcement	15 December 2020
4	Financial Close	30 April 2021
5	Construction	May 2021 – June 2022
6	Commissioning	June 2022

The table above clearly depicts the dependence of the project on the RMIPPPP's timelines. Any delay or acceleration within the RMIPPPP will have a corresponding effect on the timelines of the projects.

4. LEGISLATIVE AND POLICY FRAMEWORK

The applicable legislation remains the same as what was considered in the Final Basic Assessment Report for Bloemsmond 3 and as such, it is not re-described in this amendment assessment report.

The table below lists the applicable legislation and describes whether any additional considerations are applicable to the amendment (i.e. that were not considered in the final EIR).

Table 3: Legislation applicable to Bloemsmond 3 including any additional considerations applicable to the amendment of the EA to include the BESS.

Legislation	Additional considerations for the proposed amendment Amendment.
NATIONAL LEGISLATION	
The Constitution of the Republic of South Africa	No additional considerations applicable to the amendment

Legislation	Additional considerations for the proposed amendment Amendment.
National Environmental Management Act (NEMA)	This application is being undertaken in terms of this legeslation. No additional activities listed in terms of this legislation are applicable to the Amendment.
National Environmental Management: Biodiversity (Act 10 of 2004)	The proposed positioning of the BESS within the authorised footprint remains on vegetation type classified as least threatened in terms of this legislation. No additional impact or permitting requirements (TOPS permits) are applicable to this amendment.
Conservation of Agricultural Resources Act – CARA (Act 43 of 1983):	No additional considerations applicable to the amendment.
The Subdivision of Agricultural Land, Act 70 Of 1970	No additional considerations applicable to the amendment
National Water Act, No 36 of 1998	No additional considerations applicable to the amendment
National Forests Act (No. 84 of 1998):	No additional considerations applicable to the amendment
National Heritage Resources Act, 25 of 1998	SAHRA have approved the development footprint in terms of Section 38 of the National Heritage Resources Act. This authorised footprint remains unchanged and it is thus unlikely that further approval in terms of the NHRA will be applicable.. SAHRA will however be given an opportuity to comment on this amendment assessment report.
National Energy Act (No. 34 of 2008)	No additional considerations applicable to the amendment.
PROVINCIAL LEGISLATION	
Northern Cape Nature Conservation Act, No. 9 of 2009	No additional considerations applicable to the amendment
Nature and Environmental Conservation Ordinance, No 19 of 1974	No additional considerations applicable to the amendment
Astronomy Geographic Advantage Act, 2007 (Act No 21 Of 2007)	No additional considerations applicable to the amenment. SKA SA provided comment on the facility confirming a low risk to SKAsa. It is likely that this low risk will remain for the amendment. SKAsa will however be given an opportuity to comment on this amendment assessment report.
Northern Cape Provincial Spatial Development Framework (PSDF) 2012	No additional considerations applicable to the amendment
GUIDELINES, POLICIES AND AUTHORITATIVE REPORTS	
National Protected Area Expansion Strategy (NPAES) for S.A. 2008 (2010)	No additional considerations applicable to the amendment. The project footprint remains unchanged and thus outside of any protected area expansion focus areas.
Critical Biodiversity Areas	No additional considerations applicable to this amendment. The project footprint remains unchanged and thus still outsite of any critical biodiversity areas.
White Paper on the Renewable Energy Policy of the Republic of South Africa (2003)	No additional considerations applicable to the amendment
White Paper on the Energy Policy of the Republic of South Africa (1998)	No additional considerations applicable to the amendment
Integrated Energy Plan (IEP), 2015	No additional considerations applicable to the amendment.
Integrated Resource Plan for Electricity (2010-2030)	No additional considerations applicable to the amendment
National Development Plan 2030 (2012)	No additional considerations applicable to the amendment.
Strategic Infrastructure Projects (SIPs)	No additional considerations applicable to the amendment.
The Convention on the Conservation of Migratory Species of Wild Animals	No additional considerations applicable to the amendment.
Guidelines to minimise the impacts on birds of Solar Facilities and Associated Infrastructure in South Africa	No additional considerations applicable to the amendment The monitoring regime remains the same as was assessed.
Environmental Impact Assessment Guideline for Renewable Energy Projects	No additional considerations applicable to the amendment.
Sustainability Imperative	No additional considerations applicable to the amendment.

5. SITE DESCRIPTION AND ATTRIBUTES

As the proposed BESS falls entirely within the previously assessed and authorised footprint, the site description and attributes associated with this amendment remain unchanged from what was presented in the original environmental assessment.

6. ASSESSMENT OF IMPACTS ASSOCIATED WITH THE PROPOSED AMENDMENTS

As agreed to with the competent authority during the pre application meeting, this amendment assessment is supplemented with statements from the following specialists:

- Terrestrial Ecology (Enviro Insight & Confluent Environmental, 2020)
- Avifauna (Enviro Insight & Confluent Environmental, 2020)
- Botany (Enviro Insight & Confluent Environmental, 2020)
- Freshwater Ecology (Confluent Environmental, 2020)
- Agricultural (Lubbe, 2020)
- Palaeontology (Almond, 2020)
- Archaeology and Heritage (HCAC, 2020)
- Visual (Stead, 2020)
- Socio Economic (Barbour, 2020)

The findings of each of these specialists relating to the potential impacts of the BESS are summarised in the following sections.

6.1 TERRESTRIAL FAUNA IMPACTS

An Ecological Statement (encompassing Terrestrial Fauna and Botany) was undertaken by Enviro Insight in conjunction with Confluent Environmental. A copy of this assessment is attached in **Annexure E1**.

The specialist concluded that the addition of BESS to Bloemsmond 3 does not indicate significant additional impacts to the environment which will change any existing impacts as previously assessed.

The inclusion of BESS for the project should be done taking the necessary precautions into account.

All provincially protected species recorded on the study area that will be affected by the proposed BESS development are subjected to the Northern Cape Nature Conservation Act (Act No 9 of 2009) which require a permit from the competent authority for the removal and relocation of these species. Furthermore, protected trees influenced by the proposed development including Boscia albitrunca and Vachellia erioloba will require permits for their removal ain terms of the National Forest Act (Act No 84 of 1998) should they occur within the footprint of the BESS.

Considering this statement provided by the specialist ecologist, the terrestrial faunal impacts of the BESS are as follows.

Table 4: Significance of impacts for the BESS amendment on Terrestrial Fauna

Nature of Impact	Significance as authorised.	Overall significance of facility with ESS Amendment.
Slashing of vegetation	Medium negative	Medium negative
Rammed in H beams	Medium negative	Medium negative
Site camps and laydown areas	Medium negative	Medium negative
Direct loss of flora species of conservation concern and flora species endemic to the region	Medium negative	Medium negative
Stochastic events such as fire	Low/Medium negative	Low/Medium negative
Staff or construction workers poaching and hunting	Low negative	Low Negative
Collisions with vehicles	Low/Medium negative	Medium negative

Intentional killing of fauna	Low negative	Low negative
Loss of species of conservation concern	Medium negative	Medium Negative
Vegetation clearing/ construction preparation	Low/Medium negative	Low/Medium negative
Access roads and construction works	Low/Medium negative	Low/Medium negative
Solar panels (operational)	Low/Medium negative	Low/Medium negative
Vehicles and machinery	Medium negative	Medium negative
Soil disturbance	Low/Medium negative	Low/Medium negative
Vegetation clearing	Low/Medium negative	Low/Medium negative
Roads and hardened surfaces	Low/Medium negative	Low/Medium negative

6.2 AVIFAUNAL IMPACTS

An Avifaunal Statement was undertaken by Enviro Insight in conjunction with Confluent Environmental. A copy of this assessment is attached in **Annexure E1**.

The specialist concluded that the addition of BESS to Bloemsmond 3 does not indicate significant additional impacts to the environment which will change any existing impacts as previously assessed.

6.3 AGRICULTURAL IMPACTS

An Agricultural Impact Statement was undertaken by Christo Lubbe. A copy of this assessment is attached in **Annexure E1**. As part of this statement, the agricultural specialist confirmed that the BESS:

1. will not change or increase the nature or severity of any of the agricultural impacts originally identified and reported in 2019;
2. Will have no additional impacts to those identified previously in his study; and
3. Will not require any additional management outcomes or mitigation measures for the agricultural environment that were not indicated during the previous study.

The rationale for these findings are that:

- The BESS will indeed be placed within the authorised footprint and that no additional agricultural land will be involved or lost;
- The construction of the BESS will have no additional influence on erosion or drainage patterns on site, since it will be located on higher local elevation with runoff taking place outwards into drainage lines or towards pans.
- During construction, spillage of fuel or concrete is possible, as with the construction of all other components of the facility. Mitigation measures prescribed will be the same in this case.
- It is likely that the batteries will require solid foundations like concrete pads or steel decks, which are not different from the foundations for the pylons of the connection line, foundations for auxiliary buildings and the substation.

The specialist furthermore confirmed that from an agricultural view point, there are no additional management or mitigation measures required for the Battery Energy Storage System.

Considering this statement provided by the agricultural specialist, the impacts on agricultural resources of the facility as authorised and the facility with the inclusion of the BESS are sumarised in the table below.

Table 5: Significance of overall impacts for the BESS amendment on Agricultural Resources

Nature of Impact	Significance of impact as authorised.	Overall significance of impact, including BESS Amendment.
Soil pollution with contaminants during the construction phase may take place, including spillages of hydrocarbon (fuel oil) and cement. This is possible during the construction of all facets of the facility: laydown area, concrete foundations of the auxiliary buildings,	Low negative	Low negative

Nature of Impact	Significance of impact as authorised.	Overall significance of impact, including BESS Amendment.
inverter stations subterranean cabling, main access and internal service roads.		
The establishment of the PV Solar facility will be done at the expense of agricultural land. The area to be lost for agricultural development would be 320ha in size. This includes the area under PV panels, internal service roads and temporary laydown area	Low negative	Low negative
The construction of a PV Solar facility will cause impairment of the land capability with the potential risk of erosion	Low negative	Low negative
The establishment of the PV Solar facility may alter drainage patterns with construction and cause erosion	Low negative	Low negative
Soil pollution with contaminants during the operational phase may take place, including spillages of hydrocarbon (fuel oil) and cement. This is possible during the maintenance of the facility.	Low negative	Low negative
The establishment of the PV Solar facility will be done at the expense of agricultural land. Area to be lost for agricultural development would be 320 ha in size. This includes the area under PV panels, internal service roads and temporary laydown area.	Low negative	Low negative
The quantity of available soil for agricultural production decreases as result of the footprints of these facilities. The quality of soil decreases in the way the construction of these structures alters the workability of the soil. This includes the physical deformation in the soil profile (Cumulative)	Medium negative	Medium negative
Clearing of vegetation increases flow speed and a lower infiltration tempo increases silt transport (Cumulative)	Medium negative	Medium negative
Chemicals, hazardous substances and waste used or generated during live span of the facility accumulate and pollute soil will become contaminated (Cumulative)	Medium negative	Medium negative

6.4 HERITAGE IMPACTS

A Heritage Impact Statement was undertaken by Mr Jaco van der Walt. A copy of this assessment is attached in **Annexure E4**.

In this statement, the Heritage specialist confirmed that based on the findings of the 2019 heritage assessment there is no objection to the approval of the proposed BESS amendment for the following reasons:

- The inclusion of a BESS adjacent to the on-site substation will not change the nature or significance of the impacts assessed in the 2019 study;
- The BESS is unlikely to result in any additional impacts that was not previously assessed and;
- No additional management or mitigation measures over and above the recommendations made in the 2019 report (with special reference to chance find procedures) are applicable to the BESS.

6.5 PALAEONTOLOGICAL IMPACTS

A Palaeontological Impact Statement was undertaken by Dr John Almond. A copy of this assessment is attached in **Annexure E5**. As part of this statement, the palaeontology specialist confirmed the following:

A palaeontological heritage assessment (PIA) of the Bloemsmond 3 Facility near Upington was submitted by the specialist in 2019. This study cconcluded that, given the low palaeontological sensitivity of the project area

1. the proposed development was unlikely to have a significant impact on local fossil heritage resources and
2. pending the potential discovery of significant new fossils remains before or during construction, exemption from further specialist palaeontological studies and mitigation should be granted for this development.

Given the generally low to very low palaeontological sensitivity of the Bloemsmond Solar 3 project area, the specialist concluded that:

- the inclusion of a BESS adjacent to the on-site substation will not change the nature or significance any of the impacts assessed in the original PIA study;
- the proposed BESS is unlikely to result in any additional impacts that where not previously assessed; and
- there are no additional management outcomes or mitigation measures in terms of palaeontological heritage that would be applicable to the proposed BESS.

6.6 VISUAL IMPACTS

A Visual Impact Statement was undertaken by Mr Stephen Stead of VRMA. A copy of this assessment is attached in **Annexure E6**.

This visual statement confirmed that due to the relative remoteness of the locality and some topographic screening, no sensitive receptors were identified for the site.

As such, the visual exposure and sensitivity of the landscape tothe proposed BESS project is defined as **Low**. Based on the VRM methodology, the scenic quality of the area is defined as Medium.

There is a good policy fit for the Bloemsmond 3 PV Facility (located within the REDZ7), and the region already depicts a number of large-scaled renewable energy projects that define the sense of place.

Thus, the findings of this visual statement are that the BESS development for Bloemsmond 3 PV Facility is unlikely to result in the loss of significant visual and scenic resources, and as such should be allowed to proceed provided that the mitigation measures detailed in the orininal VIA are implemented.

6.7 FRESHWATER ECOLOGY IMPACTS

A Freshwater Impact Statement was undertaken by Dr Jackie Dabrowski of Confluent Environmental. A copy of this assessment is attached in **Annexure E2**.

The freshwater specialist confirmed that two small pans and an associated drainage line are the only aquatic features located in proximity to the proposed BESS.

While the BESS would be marginally closer to these aquatic features, the actual footprint and location is not considered to be much greater than what was previously proposed. Furthermore, the BESS does not encroach on any of the buffers stipulated for the pans and drainage line.

Localised impacts at the site could be a slight nett increase in the amount of hardened surfaces compared to the previous layout as disturbance to soil and vegetation around the PV array was to be minimised.

The recommendation still applies to the BESS where as much of the natural surface (vegetation and soil) should be retained within the facility (already recommended in the initial study). Apart from these minor impacts, there are no novel site-specific or cumulative impacts to aquatic ecosystems anticipated from inclusion of the BESS. Therefore, inclusion of the BESS will not change the nature or significance of any of the impacts assessed in this study. The risk to aquatic habitat, flow, geomorphology and biota is considered to be low.

The freshwater specialist recommended the following additional mitigation measures to be applicable to the BESS.

- Ensure thermal management safety protocols are in place to reduce the risk of such an event;
- In the unlikely event of a thermal runaway, any contamination of land (including any nearby watercourse) that occurs as a result of this event needs to be contained and cleaned up by a specialist contractor and the area rehabilitated to its former state.

Considering this statement provided by the specialist, the Freshwater Ecology impacts of the facility as authorised and the facility with the inclusion of the BESS are sumarised in the table below.

Table 6: Significance of overall impacts for the BESS amendment on Freshwater Ecology

Nature of Impact	Significance of impact as authorised.	Overall significance of impact, including BESS Amendment.
Disturbance to riparian habitat	Negligable negative	Negligable negative
Disturbance to watercourse bed and banks	Negligable negative	Negligable negative
Sedimentation of downstream watercourses	Negligable negative	Negligable negative
Water quality impacts downstream	Negligable negative	Negligable negative
Alien plant introduction	Negligable negative	Negligable negative
Alien Vegetation Management	Negligable negative	Negligable negative
Solar Panel Washing	Negligable negative	Negligable negative
Spills and Waste Management	Negligable negative	Negligable negative

6.8 SOCIAL IMPACTS

A Social Impact Statement was undertaken by Mr Tony Barbour. A copy of this assessment is attached in **Annexure E7**.

The social specialist confirmed that based on a review of the project information, the following findings were made.

- The inclusion of the proposed BESS adjacent to the on-site substation will not impact on nature or significance any of the social impacts (negative and or positive) identified and assessed by the SIA (2019).
- The inclusion of the proposed BESS adjacent to the on-site substation will not result in any additional social impacts (negative and or positive).
- The inclusion of the proposed BESS adjacent to the on-site substation will not require additional management and or mitigation measures to be identified and or implemented.

Considering this statement provided by the specialist, the impacts on the social environment of the facility as authorised and the facility with the BESS amendment are sumarised in the table below.

Table 7: Significance of overall impacts for the BESS amendment on Social resources.

Nature of Impact	Significance of impact as authorised.	Overall significance of impact, including BESS Amendment.
Creation of employment and business opportunities	Medium positive	Medium positive
Presence of construction workers and potential impacts on family structures and social networks.	Low negative	Low negative
Influx of job seekers.	Low negative	Low negative
Safety risk, stock theft and damage to farm infrastructure associated with presence of construction workers.	Low negative	Low negative
Increased risk of veld fires	Low negative	Low negative
Impact of heavy vehicles and construction activities.	Low negative	Low negative
Loss of farmland.	Low negative	Low negative
Promotion of renewable energy projects	High positive	High positive
Creation of employment and business opportunities	Medium positive	Medium positive
Establishment of Community Trust	High positive	High positive

Generate income for affected landowner/s	Medium positive	Medium positive
Visual impact and impact on sense of place	Low negative	Low negative
Impact on tourism	Low positive and negative	Low positive and negative

6.9 CUMULATIVE IMPACT ASSESSMENT

The cumulative impact of the facility as a whole was considered and assessed in detail in the previous Basic Assessment Process. The main cumulative impact assessed in the BAR process was the potential fragmentation of the landscape and the ability to attain conservation targets in the affected vegetation type. The proposed amendment includes the construction and operation of a BESS that falls within the authorised footprint and as such will not have any additional cumulative impact.

6.10 IMPACT SUMMARY

The table below provides a comparative summary of the nature and significance of overall impacts orinally assessed vs those associated with the addition of the BESS. As can be seen in this summary table, the proposed amendment does not change the nature, nor the significance of the impacts already assessed.

Table 8: Comparative summary of the significance of impacts associated with Bloemsmond 3 as authorised and those associated with the addition of the BESS.

Impact	**Significance of impact as authorised.**	**Overall significance of impact, including BESS Amendment.**
Social Impacts		
Creation of employment and business opportunities	Medium positive	Medium positive
Presence of construction workers and potential impacts on family structures and social networks.	Low negative	Low negative
Influx of job seekers.	Low negative	Low negative
Safety risk, stock theft and damage to farm infrastructure associated with presence of construction workers.	Low negative	Low negative
Increased risk of veld fires	Low negative	Low negative
Impact of heavy vehicles and construction activities.	Low negative	Low negative
Loss of farmland.	Low negative	Low negative
Promotion of renewable energy projects	High positive	High positive
Creation of employment and business opportunities	Medium positive	Medium positive
Establishment of Community Trust	High positive	High positive
Generate income for affected landowner/s	Medium positive	Medium positive
Visual impact and impact on sense of place	Low negative	Low negative
Impact on tourism	Low positive and negative	Low positive and negative
Visual Impacts		
Change of local and surrounds visual resources due to the construction and operation of the proposed PV structures, and buildings.	Low negative	Low negative
Change of local and surrounds visual resources due to the construction and operation of the proposed road access.	Low negative	Low negative
Palaeontological Impacts		
Impact on potential palaeontological resources	Low negative	Low negative
Agricultural Impacts		
Soil pollution with contaminants during the construction phase may take place, including spillages of hydrocarbon (fuel oil) and cement. This is possible during the construction of all facets of the facility:	Low negative	Low negative

Impact	Significance of impact as authorised.	Overall significance of impact, including BESS Amendment.
laydown area, concrete foundations of the auxiliary buildings, inverter stations subterranean cabling, main access and internal service roads.		
The establishment of the PV Solar facility will be done at the expense of agricultural land. The area to be lost for agricultural development would be 320ha in size. This includes the area under PV panels, internal service roads and temporary laydown area	Low negative	Low negative
The construction of a PV Solar facility will cause impairment of the land capability with the potential risk of erosion	Low negative	Low negative
The establishment of the PV Solar facility may alter drainage patterns with construction and cause erosion	Low negative	Low negative
Soil pollution with contaminants during the operational phase may take place, including spillages of hydrocarbon (fuel oil) and cement. This is possible during the maintenance of the facility.	Low negative	Low negative
The establishment of the PV Solar facility will be done at the expense of agricultural land. Area to be lost for agricultural development would be 320 ha in size. This includes the area under PV panels, internal service roads and temporary laydown area.	Low negative	Low negative
The quantity of available soil for agricultural production decreases as result of the footprints of these facilities. The quality of soil decreases in the way the construction of these structures alters the workability of the soil. This includes the physical deformation in the soil profile (Cumulative)	Medium negative	Medium negative
Clearing of vegetation increases flow speed and a lower infiltration tempo increases silt transport (Cumulative)	Medium negative	Medium negative
Chemicals, hazardous substances and waste used or generated during live span of the facility accumulate and pollute soil will become contaminated (Cumulative)	Medium negative	Medium negative
Freshwater Ecology Impacts		
Disturbance to riparian habitat	Negligable negative	Negligable negative
Disturbance to watercourse bed and banks	Negligable negative	Negligable negative
Sedimentation of downstream watercourses	Negligable negative	Negligable negative
Water quality impacts downstream	Negligable negative	Negligable negative
Alien plant introduction	Negligable negative	Negligable negative
Alien Vegetation Management	Negligable negative	Negligable negative
Solar Panel Washing	Negligable negative	Negligable negative
Spills and Waste Management	Negligable negative	Negligable negative
Terrestrial Fauna Impacts		
Slashing of vegetation	Medium negative	Medium negative
Rammed in H beams	Medium negative	Medium negative
Site camps and laydown areas	Medium negative	Medium negative
Direct loss of flora species of conservation concern and flora species endemic to the region	Medium negative	Medium negative
Stochastic events such as fire	Low/Medium negative	Low/Medium negative
Staff or construction workers poaching and hunting	Low negative	Low Negative
Collisions with vehicles	Low/Medium negative	Medium negative
Intentional killing of fauna	Low negative	Low negative
Loss of species of conservation concern	Medium negative	Medium Negative
Vegetation clearing/ construction preparation	Low/Medium negative	Low/Medium negative
Access roads and construction works	Low/Medium negative	Low/Medium negative
Solar panels (operational)	Low/Medium negative	Low/Medium negative
Vehicles and machinery	Medium negative	Medium negative
Soil disturbance	Low/Medium negative	Low/Medium negative
Vegetation clearing	Low/Medium negative	Low/Medium negative
Roads and hardened surfaces	Low/Medium negative	Low/Medium negative

As can be seen in in the table above, the proposed amendment does not change the nature, nor the significance of the impacts already assessed.

6.11 IMPACT STATEMENT

None of the participating specialists identified any new impacts that were not previously assessed, nor did they identify any major changes in the significance of the impacts that were previously assessed. The BESS will marginally increase the surface water run-off associated with the facility as a whole but not to such an extent that the overall impact significance would increase.

It can therefore be stated with a relatively high level of confidence that the addition of the BESS to the authorised facility will not result in any unacceptable environmental impacts.

7. MITIGATION MEASURES

Based on the outcome of this environmental assessment, it is reccomended that the fllowing additional mitigation measures be included as conditions of authorisation of the amendment decision:

- The applicant must compile and implement a Lifecycle Battery Recycling Programme. This programme should be submitted to the competent authority for approval prior to the commencement of construction of the BESS;
- The applicant must compile and implement a thermal management and monitoring programme. This programme should be completed prior to the operation of the BESS;
- During the construction phase of the project, first responders from Upington and Keimoes (such as fire fighters and paramedics) must be given appropriate training on dealing with any emergency situation that may occur as a result of the BESS. Such training must be provided by the technology suppliers or an appointed service provider.
- The applicant must compile and implement a comprehensive BESS operations and maintenance programme to ensure all monitoring and protective devices remain in good working order. This comprehensive operations and maintenance programme must amongst others ensure thermal management safety protocols are in place.
- In the unlikely event of a thermal runaway, any contamination of land (including any nearby watercourse) that occurs as a result of this event needs to be contained and cleaned up by a specialist contractor and the area rehabilitated to its former state.

A BESS bess risk assessment is attached in Annexure G. This risk assessment identified a additional mitigations that would need to be implemented prior to the construction of the BESS facility.

Table 9: BESS Risk assessment detailing additional mitigation measures required prior to commencement of construction.

Risk / Impact	Discussion	Likelihood of Risk	Impact of risk	Management / Mitigation
BESS component / equipment risks				
Mishandling	Considering that a battery is a source of energy, there is a danger that should it be punctured, incinerated, crushed, immersed, have a forced discharge or exposed to temperatures above the declared operating temperature range of the product, there is a risk that an internal or external short circuit may occur. An internal or external short circuit can cause significant overheating which in some cases could result in fire, that could affect surrounding materials or materials within the cell or battery.	Low	Electrocution. On site fires. Electrical failure. Potential spillage of electrolytes (very low likelihood with lithium batteries).	Training and well managed operations and maintenance. Under normal conditions of use, the electrode materials and electrolyte they contain are not exposed, provided the battery integrity is maintained and seals remain intact. Risk of exposure may occur only in cases of abuse (mechanical, thermal, electrical).

Risk / Impact	Discussion	Likelihood of Risk	Impact of risk	Management / Mitigation
Mechanical Damage	If batteries are not properly stored when not in use prior to installation, there is a possibility that mechanical damage may occur leading to: • Leaked battery pack coolant • Leaked refrigerant • Leaked cell electrolyte • Rapid heating of individual cells due to exothermic reaction of constituent materials (cell thermal runaway), venting of cells, and propagation of self-heating and thermal runaway reactions to neighbouring cells. • Fire	Low	On site fires. Electrical failure. Potential spillage of electrolytes or refrigerant.	Adequate on-site management during the construction and operations and maintenance periods.
Leaked Coolant or Refrigerant	Thermal management of some Li-ion battery packs is achieved via liquid cooling using coolant or refrigerant products. Mechanical damage of a battery pack that has been installed could result in leakage of the coolant. The fluid is generally blue in colour and does not emit a strong odour. This coolant if released has toxicological hazards and ecological effects as well as additional impacts relating to the disposal of leaked fluids. Additionally, extended exposure of the battery system to leaked coolant could cause additional damage to the product such as corrosion and compromising of protection electronics.	Low	Potential spillage of electrolytes. Ecological damage. Electrical failure.	Maintenance. Source from reputable manufacturers. Safe and appropriate storage. Safe handling which must include battery inspection prior to installation.
Vented Electrolyte	Li-ion cells are sealed units, and thus under normal usage conditions, venting of electrolyte should not occur. If subjected to abnormal heating or other abuse conditions, electrolyte and electrolyte decomposition products can vaporize and be vented from cells. Accumulation of liquid electrolyte is unlikely in the case of abnormal heating. Vented gases are a common early indicator of a thermal runaway reaction – an abnormal and hazardous condition.	Low	On site fires. Electrical failure. Vent gases.	Maintenance. Source from reputable manufacturers. Safe and appropriate storage. Safe handling which must include battery inspection prior to installation.
Thermal Runaway (TR)	Li-ion battery thermal runaway occurs when a cell, or area within the cell, achieves elevated temperatures due to thermal failure, mechanical failure, internal/external short circuiting and electrochemical abuse. At elevated temperatures, exothermic decomposition of the cell materials begins. Eventually, the self-heating rate of the cell is greater than the rate at which heat can be dissipated to the surroundings, the cell temperature rises exponentially, and stability is ultimately lost. The loss in stability results in all	Low	On site fires. Electrical failure. Potential spillage of electrolytes.	Maintenance. Despite various factors that may lead to TR, materials including electrode materials as well as electrolytes, and battery design such as negative/positive capacity ratio and venting control, to name but a few, are the intrinsic approaches to enhance the battery safety. Source from reputable manufacturers.

Risk / Impact	Discussion	Likelihood of Risk	Impact of risk	Management / Mitigation
	remaining thermal and electrochemical energy being released to the surroundings. It's widely accepted that most TRs are caused by mechanical, electrical or thermal abuses.			Safe and appropriate storage. Safe handling which must include battery inspection prior to installation. Development and implementation of Thermal Management Plan.
Limited knowledge and experience of First Responders to deal with emergency incidents.	As this technology is relatively new in a South African context, the first responders in an unlikely event of an incident may not have the necessary knowledge or experience to deal with an emergency situation such as fire or leakage.	Low	Fire. Electrocution. Injury. Inability to contain spillage.	During the construction phase of the project, first responders from the nearest major centre (such as fire fighters and paramedics) must be given appropriate training on dealing with any emergency situation that may occur as a result of the BESS. Such training must be provided by the technology suppliers or an appointed service provider. Appropriate warnings and Standard Operating Procedure for emergency events must be developed and must be provided to the local emergency services and the O&M staff on site.
Disposal at end of life	Disposal of Li-ion batteries to landfill is problematic and recycling should be prioritised. Research in Australia found that just 2% of the country's 3,300 tonnes of Li-ion waste is recycled. South Africa fares far worse (as of November 2019, there was no Li-ion battery recycling facility in South Africa (eWASA)) and Li-ion batteries along with significant amounts of e-waste are not properly disposed of or sent for recycling. In addition to the lithium, manufacturers are secretive about what actually goes into their batteries, which makes it harder to recycle them properly. And while lithium itself isn't of great concern from a pollution angle, these batteries do contain metals like cobalt, nickel, and manganese. The potentially toxic materials contained in batteries means that they are classified as hazardous materials in terms of NEM:WA. There are only a few licensed hazardous waste sites in South Africa and recycling of batteries and e-waste has been identified as a sure way of improving the lifespans of such sites.	High	Potential scenario of fluids from the batteries leaking into environment. The release of such chemicals through leaching, spills or air emissions can harm communities, ecosystems and food production.	Recovery of metals at end of life can significantly reduce these life cycle impacts. This is because the extraction and processing of virgin materials are key contributors to impacts for all battery chemistries. Prior to commencement of the activity, a dedicated Battery Recycling Programme must be compiled and adopted.
General Environmental Risks				

Risk / Impact	Discussion	Likelihood of Risk	Impact of risk	Management / Mitigation
Hydrocarbon Spillage	The BESS area will contain transformers which contain oil for cooling (unless air-cooled). Temporary fuel storage will take place during the construction phase.	Low	Contamination of land and adjacent water resources.	Implementation of the Management actions already included in the EMPr.
Physical damage to surrounding natural areas	Construction activities if not properly managed could impact on areas outside of the construction footprint.	Medium	Physical damage to habitat.	Implementation of the Management actions already included in the EMPr particularly in relation to the demarcation of no-go areas.
Impact on species of conservation concern	The transformation of habitat associated with the BESS, may have a direct impact on species of conservation concern.	Medium	Loss of individual plants within the footprint of the BESS.	Implementation of the Management actions already included in the EMPr. Compliance with the conditions of the Threatened or protected species (TOPS) permits. Undertaking plant rescue in compliance with the plant rescue and protection plan.
Concrete contamination	Run off from concrete civil works could contaminate surrounding areas.	Low	Contamination of land and surrounding water resources.	Implementation of the Management actions already included in the EMPr. Use of ready-mix concrete and the limitation of on-site batching.
Dust	Dust fall out from construction activities.	Medium	Health and safety impacts. Impacts on surrounding vegetation.	Implementation of the Management actions already included in the EMPr. Implementation of a dust fall out monitoring programme.
Protection of Archaeological Resources	Subterranean resources could be exposed during excavations.	Low	Loss of archaeological resources.	Implementation of the Management actions already included in the EMPr. ECO Inspection of all excavations. Compliance with requirements of SAHRA authorisation.
Loss of topsoil resources	All construction activities will have the possibility to impact on topsoil resources.	Low	Loss of Topsoil Contamination of Topsoil.	Implementation of the Management actions already included in the EMPr particularly with regard to topsoil handling and the stripping and stockpiling of topsoil from the BESS footprint prior to construction.

Risk / Impact	Discussion	Likelihood of Risk	Impact of risk	Management / Mitigation
Noise Impact	Although the proposed development is located outside of an urban area, construction noise could have an impact on sensitive receptors.	Low	Impact on health and safety of construction staff. Impact on displacement of fauna.	Implementation of the Management actions already included in the EMPr and compliance with the relevant legislation with respect to noise inter alia Section 25 of ECA (73 of 1989) and standards applicable to noise nuisances in the Occupational Health and Safety Act (No. 85 of 1993).
Siltation and erosion	Stormwater and wash water have the potential to cause erosion or pollution of the receiving environment.	Low	Contamination of surrounding land. Impact on water Quality.	Implementation of the Management actions already included in the EMPr. Implementation of the Stormwater Management Plan.
Theft and other crime.	An increase in crime during the construction phase is often a concern during the development of the overall facility, including the BESS. This is likely to be negligible due to the extremely remote nature of the site.	Low	On site theft. Theft at surrounding properties.	Implementation of the Management actions already included in the EMPr. Implementation of a site security plan.
Wildfires	The solar development site including the BESS is arid, with sparse vegetation cover and fires are not a natural phenomenon in the area. However, under exceptional circumstances, such as following years of very high rainfall, sufficient biomass may build up to carry fires.	Low	Damage to infrastructure.	Implementation of the Management actions already included in the EMPr. Maintaining a firebreak around the total project footprint in the form of a perimeter road.

8. PUBLIC PARTICIPATION PROCESS

The public participation process for this amendment process was undertaken in terms of in terms of regulation 32(1)(aa) which requires that the public participation in respect of a part 2 amendment must be undertaken to a level as agreed upon with the competent authority (in this instance the approval of the public participation plan.

8.1 PUBLIC PARTICIPATION PLAN

A public participation plan has been compiled and approved by the competent authority.

This plan was submitted in compliance with regulation GNR660 published on 05 June 2020 in terms of the Disaster Management Act (57/2002) and titled: Directions Regarding Measures to Address, Prevent and Combat the Spread of COVID-19 Relating to National Environmental Management Permits and Licences. In compliance with section 5.1 and annexure 2 of these regulations, a public participation plan must be presented to the competent authority for approval prior to implementation.

This application is for a part 2 amendment of an existing EA and is submitted in terms of regulation 31. The public participation requirements for a part 2 amendment are contained in regulation 32(1)(aa),

which requires that the report (i.e. amendment assessment report) be subjected to a public participation process, which had been agreed to by the competent authority, and which was appropriate to bring the proposed change to the attention of potential interested and registered interested and affected parties, including organs of state, which have jurisdiction in respect of the relevant activity and the competent authority.

Cape EAPrac's proposal to comply with regulation 32(11)aa of the NEMA EIA regulations and Regulation 660 in terms of the disaster management act is as follows:

An amendment assessment report will be compiled to assess the impact of the addition of a Battery Energy Storage System (BESS) within the footprint authorised for the project. This Amendment Assessment Report will include:

1. Statements from all participating specialists confirming whether or not the addition of the BESS will change the nature or impact of any of the impacts that were assessed as part of specialist studies.
2. Statements from all participating specialists to confirm whether or not the addition of a BESS within the assessed footprint will result in any additional impacts in respect of their particular specialist discipline.
3. Statements from participating specialists to confirm whether any additional management actions or mitigations are applicable to the addition of a BESS.
4. A BESS technical study.
5. A high-level BESS risk assessment.
6. An addendum to the existing EMPr (incorporating an application to amend the existing EMPr) to incorporate additional management outcomes and actions associated with the BESS.

Notification of the availability of the amendment assessment report (incorporating points 1-6 above) will be sent to the following parties:

(a) the competent authority;

(b) every State department that administers a law relating to a matter affecting the environment relevant to an application for the amendment of an environmental authorisation;

(c) all organs of state which have jurisdiction in respect of the activity to which the application for amendment relates;

(d) all I&APs that were registered as part of the original EIA process;

(e) all I&APs that were registered on other EIAs that took place on the same properties; and

(f) all neighbouring property owners.

The amendment assessment report will be accessible to the abovementioned parties via the following mechanisms:

1. The competent authority will be provided copies of the applications and assessment report via their file upload portal.
2. All State Departments and Organs of State who have online submission platforms (e.g. SAHRA via their SAHRIS system) will receive copies of the reports via these platforms.
3. The digital copy of the documentation that will be available on the Cape EAPrac website.
4. A download link (via dropbox or sharepoint) will be provided to all I&APs.
5. All notification letters will include a copy of the executive summary of the Amendment Assessment Report.
6. The ward councillor will be approached for assistance to distribute notification letters along with the executive summaries via their communication channels (community WhatsApp groups, social media and physical communiques).

7. I&APs that do not have access to digital platforms will be provided with printed hardcopies of the executive summary and any specialist reports that they may have interest in. Such copies will be provided by courier or postal service.
8. Potential and registered I&APs will be informed that copies of the documentation can be provided via postal or courier services.
9. An advert will be placed in the local press. This advert will combine the call for interested and affected parties and request for comment on the Draft Amendment Assessment Report.

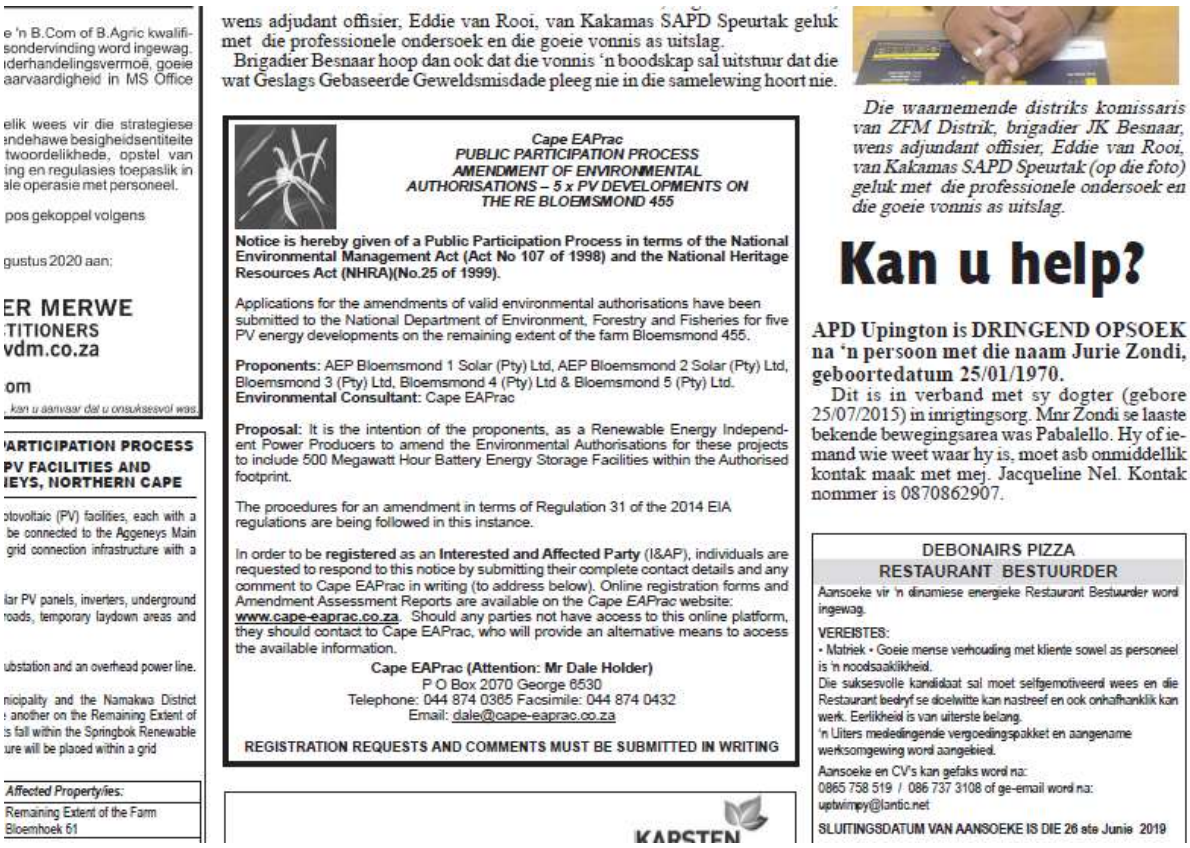
8.2 NOTIFICATION OF AVAILABILITY OF THE DRAFT REPORT

Notification of the availability of the Draft Report was submitted via email, and post to the following parties.

- the competent authority;
- State department that administers a law relating to a matter affecting the environment
- All organs of state which have jurisdiction in respect of the activity (d) all I&APs that were registered as part of the original EIA process;
- All I&APs that were registered on other EIAs that took place on the same properties; and
- All neighbouring property owners.

Copies of these notifications are attached in appendix F4.

In addition to the written notifications and in compliance with the approved public participation plan, an advert was also placed in the local press (Di Gemsbok Newspaper) notifying potential I&APs of the proposed amendment and the availability of the Draft Amendment Assessment Report. A copy of the newspaper advert is attached in appendix F3.



wens adjudant offisier, Eddie van Rooi, van Kakamas SAPD Speurtak geluk met die professionele ondersoek en die goeie vonnis as uitslag.
Brigadier Besnaar hoop dan ook dat die vonnis 'n boodskap sal uitstuur dat die wat Geslags Gebaseerde Geweldsmisdade pleeg nie in die samelewing hoort nie.

Die waarnemende distriks komissaris van ZFM Distrik, brigadier JK Besnaar, wens adjundant offisier, Eddie van Rooi, van Kakamas SAPD Speurtak (op die foto) geluk met die professionele ondersoek en die goeie vonnis as uitslag.

Cape EAPrac
PUBLIC PARTICIPATION PROCESS
AMENDMENT OF ENVIRONMENTAL AUTHORISATIONS – 5 x PV DEVELOPMENTS ON THE RE BLOEMSMOND 455

Notice is hereby given of a Public Participation Process in terms of the National Environmental Management Act (Act No 107 of 1998) and the National Heritage Resources Act (NHRA)(No.25 of 1999).

Applications for the amendments of valid environmental authorisations have been submitted to the National Department of Environment, Forestry and Fisheries for five PV energy developments on the remaining extent of the farm Bloemsmond 455.

Proponents: AEP Bloemsmond 1 Solar (Pty) Ltd, AEP Bloemsmond 2 Solar (Pty) Ltd, Bloemsmond 3 (Pty) Ltd, Bloemsmond 4 (Pty) Ltd & Bloemsmond 5 (Pty) Ltd.
Environmental Consultant: Cape EAPrac

Proposal: It is the intention of the proponents, as a Renewable Energy Independent Power Producers to amend the Environmental Authorisations for these projects to include 500 Megawatt Hour Battery Energy Storage Facilities within the Authorised footprint.

The procedures for an amendment in terms of Regulation 31 of the 2014 EIA regulations are being followed in this instance.

In order to be **registered** as an **Interested and Affected Party** (I&AP), individuals are requested to respond to this notice by submitting their complete contact details and any comment to Cape EAPrac in writing (to address below). Online registration forms and Amendment Assessment Reports are available on the *Cape EAPrac* website: www.cape-eaprac.co.za. Should any parties not have access to this online platform, they should contact to Cape EAPrac, who will provide an alternative means to access the available information.

Cape EAPrac (Attention: Mr Dale Holder)
P O Box 2070 George 6530
Telephone: 044 874 0365 Facsimile: 044 874 0432
Email: dale@cape-eaprac.co.za

REGISTRATION REQUESTS AND COMMENTS MUST BE SUBMITTED IN WRITING

Kan u help?

APD Upington is DRINGEND OPSOEK na 'n persoon met die naam Jurie Zondi, geboortedatum 25/01/1970.
Dit is in verband met sy dogter (gebore 25/07/2015) in inrigtingsorg. Mnr Zondi se laaste bekende bewegingsarea was Pabalello. Hy of iemand wie weet waar hy is, moet asb onmiddellik kontak maak met mej. Jacqueline Nel. Kontak nommer is 0870862907.

DEBONAIRS PIZZA
RESTAURANT BESTUURDER
Aansoeke vir 'n dinamiese energieke Restaurant Bestuurder word ingewag.
VEREISTES:
• Matriek • Goeie mense verhouding met kliente sowel as personeel is 'n noodsaaklikheid.
Die suksesvolle kandidaat sal moet selfgemotiveerd wees en die Restaurant bedryf se doelwitte kan nastreef en ook onhafhanklik kan werk. Eerlikheid is van uiterste belang.
'n Uiters mededingende vergoedingspakket en aangename werksomgewing word aangebied.
Aansoeke en CV's kan gefaks word na:
0865 758 519 / 086 737 3108 of ge-email word na:
uptwimpy@lantic.net
SLUITINGSDATUM VAN AANSOEKE IS DIE 28 ste Junie 2019

Figure 6: Excerpt of advert placed on Die Gemsbok.

8.3 AVAILABILITY OF DRAFT AMENDMENT ASSESSMENT REPORT

In compliance with the approved public participation plan, the Draft Amendment Assessment Report was available at the following locations.

- Cape EAPrac Website; and
- Via a dedicated download link.

The notifications referred to above provided a list of alternative mechanisms where potential interested and affected parties could obtain copies of the report. Potential I&APs were requested to contact Cape EAPrac, should they be unable to access the documentation via the digital platforms provided.

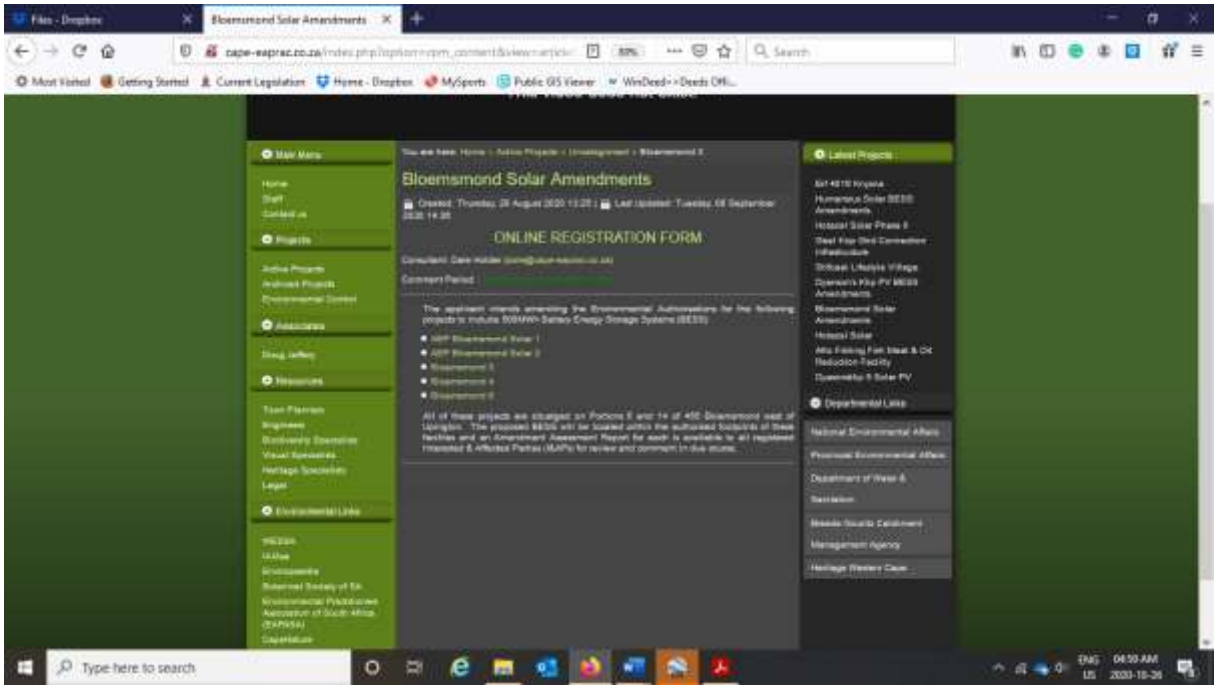


Figure 7: Draft Amendment Assessment Reports as available on the Cape EAPrac Website

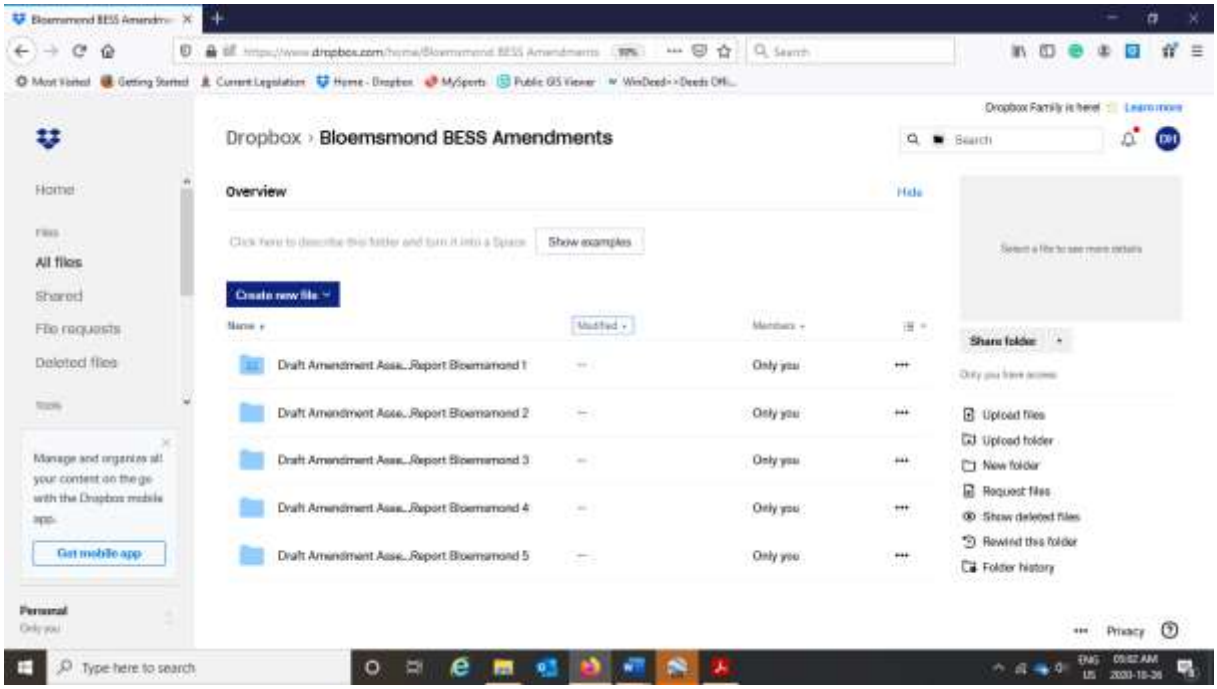


Figure 8: Draft amendment assessment report as available via the dedicated dropbox download link.

The documentation will remain on the dedicated download link at:

until such time as the appeal period on this application for amendment is complete.

All the notifications included alternative mechanisms to access reports for those parties unable to access the digital platforms provided.

https://www.dropbox.com/sh/ws8qvpaipm1j9df/AAAiiYy3QpfRRIOPjupSYY29a?dl=0

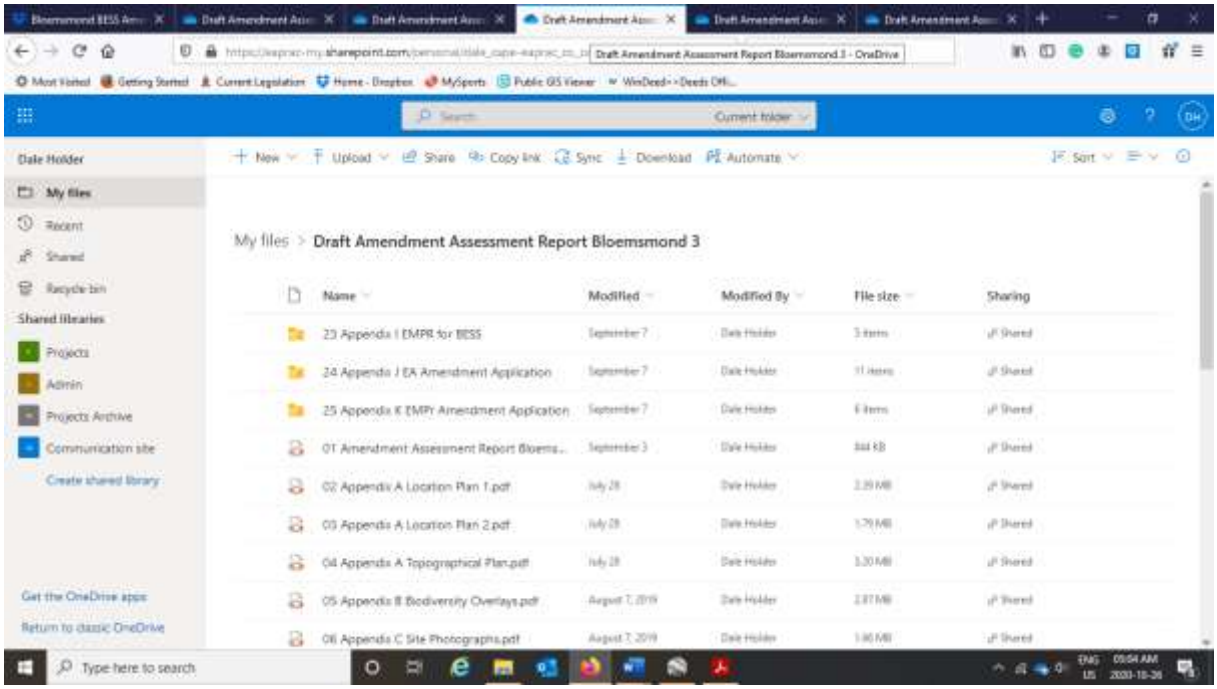


Figure 9: Draft amendment assessment report as available via the dedicated sharepoint download link.

8.4 COMMENTS ON DRAFT AMENDMENT ASSESSMENT REPORT.

During the comment period on the Draft amendment Report, comments were received from the following parties:

- The competent authority (Department of Environment Forestry and Fisheries)
- Eskom (Mr John Geeringh)
- Mr Seoka Lekota (The Department of Environment, Forestry and Fisheries Biodiversity Directorate)

Copies of these comments are all included in appendix F5. The comments as well as the responses thereto are also included in the comments and responses report in Appendix E2.

9. CONCLUSION AND RECOMMENDATIONS

This environmental process is currently being undertaken to present the details of the proposed amendment to potential and registered I&AP's and to identify and assess environmental impacts, issues and concerns that may result from the proposed amendment to the Environmental Authorisation.

Cape EAPrac is of the opinion that the information contained in this Amendment Assessment Report and the documentation attached hereto is sufficient to allow the registered and potential I&APs to apply their minds to the potential negative and/or positive impacts associated with the development, in respect of the amendments applied for.

This environmental process has not identified any fatal flaws nor major irreversible impacts with the proposed amendments. As such, it is the EAP's view that the proposed amendments can be considered for authorisation.

All participating specialists have confirmed that the inclusion of the BESS is unlikely to result in any additional impacts nor increase any of the respective impacts previously assessed.

All stakeholders were requested to review this Draft Amendment Assessment Report and the associated appendices, and provide comment, or raise issues of concern, directly to *Cape EAPrac* within the specified 30-day comment period. All comments received during this comment period were considered and incorporated into the Final Amendment Assessment Report is herewith submitted to the to DEFF for decision making.

Based on the outcomes of this assessment (which includes input from the participating specialists), as well as the outcome of the risk assessment, it is Cape EAPracs reasoned opinion that the application for amendment of the Environmental Authorisation be granted, subject to the following conditions:

1. **That the BESS Addendum to the EMPr be adopted and implemented for the life cycle of the project;**
2. **That the additional mitigation measures detailed in section 7 of this assessment report be adopted and implemented; and**
3. **That the additional mitigation measures identified in the Risk Assessment be implemented.**

10. ABBREVIATIONS

AIA	Archaeological Impact Assessment
BGIS LUDS	Biodiversity Geographic Information System Land Use Decision Support
CBA	Critical Biodiversity Area
CDSM	Chief Directorate Surveys and Mapping
CEMPr	Construction Environmental Management Programme
DEA	Department of Environmental Affairs
DEA&NC	Department of Environmental Affairs and Nature Conservation
DME	Department of Minerals and Energy
DSR	Draft Scoping Report
EAP	Environmental Impact Practitioner
EHS	Environmental, Health & Safety
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EMPr	Environmental Management Programme
ESA	Ecological Support Area
GPS	Global Positioning System
GWh	Giga Watt hour
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IFC	International Finance Corporation
IPP	Independent Power Producer
kV	Kilo Volt
LUDS	Land Use Decision Support
LUPO	Land Use Planning Ordinance

MW	Mega Watt
NEMA	National Environmental Management Act
NEMBA	National Environmental Management: Biodiversity Act
NERSA	National Energy Regulator of South Africa
NHRA	National Heritage Resources Act
NPAES	National Protected Area Expansion Strategy
NSBA	National Spatial Biodiversity Assessment
NWA	National Water Act
PM	Post Meridiem; “Afternoon”
PSDF	Provincial Spatial Development Framework
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
S.A.	South Africa
SACAA / CAA	South African Civil Aviation Authority
SAHRA	South African National Heritage Resources Agency
SANBI	South Africa National Biodiversity Institute
SANS	South Africa National Standards
SDF	Spatial Development Framework
TOPS	Threatened and Protected Species

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[2] This reference list excludes specialist studies that form part of this environmental process and which are contained in Annexure E1 – E12

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