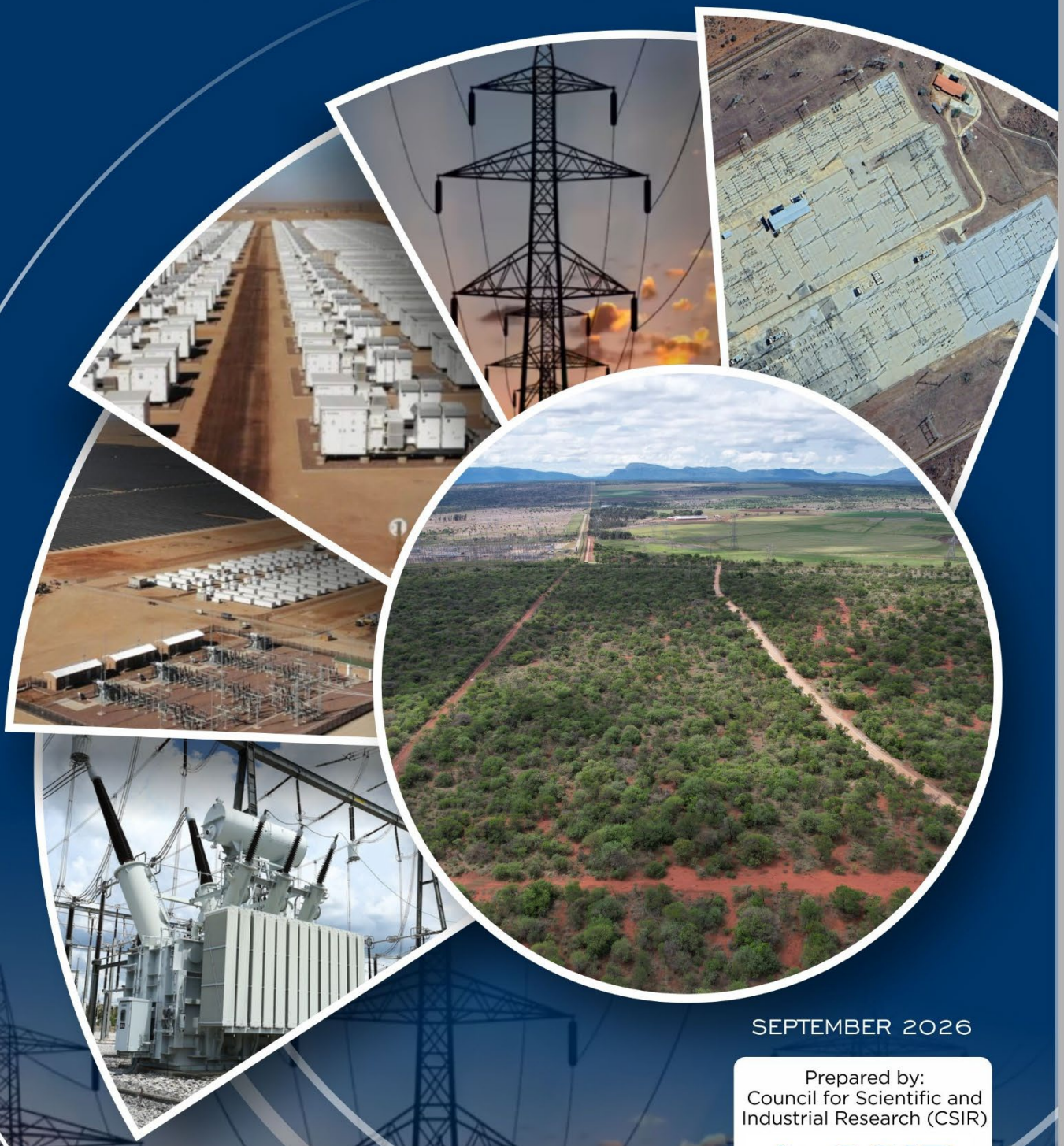
FINAL BASIC ASSESSMENT REPORT

Basic Assessment for the Proposed Development of a Battery Energy Storage System (BESS), 132 kV Loop-In-Loop-Out (LILO) Power Line from the BESS to existing Eskom infrastructure, and associated infrastructure, near Polokwane, within the Polokwane Local Municipality, Capricorn District Municipality, Limpopo



SEPTEMBER 2026

Prepared by:
Council for Scientific and Industrial Research (CSIR)

CSIR
Touching lives through innovation

Prepared for:
Veroniva (Pty) Ltd

veroniva
Renewable Energy Development

BASIC ASSESSMENT REPORT

Basic Assessment for the Proposed Development of a Battery Energy Storage System (BESS), 132 kV Loop-In-Loop-Out (LILO) Power Line from the BESS to existing Eskom infrastructure, and associated infrastructure, near Polokwane, within the Polokwane Local Municipality, Capricorn District Municipality, Limpopo

PART A: MAIN REPORT



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BASIC ASSESSMENT

for the

Proposed Development of a Battery Energy Storage System (BESS), 132 kV Loop-In-Loop-Out (LILO) Power Line from the BESS to existing Eskom infrastructure, and associated infrastructure, near Polokwane, within the Polokwane Local Municipality, Capricorn District Municipality, Limpopo

BASIC ASSESSMENT REPORT

September 2026

Prepared for:
Veroniva (Pty) Ltd

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REPORT DETAILS

Title:	Basic Assessment for the Proposed Development of a Battery Energy Storage System (BESS), 132 kV Loop-In-Loop-Out (LILO) Power Line from the BESS to existing Eskom infrastructure, and associated infrastructure, near Polokwane, within the Polokwane Local Municipality, Capricorn District Municipality, Limpopo: FINAL BASIC ASSESSMENT (BA) REPORT.	
Purpose of this report:	The purpose of this Final BA Report is to: ▪ Present the details of and the need for the proposed projects; ▪ Describe the affected environment at a sufficient level of detail to facilitate informed decision-making; ▪ Provide an overview of the BA Process that has been followed, including public consultation; ▪ Provide an overview of the potential positive and negative impacts of the proposed projects on the environment; ▪ Provide recommendations to avoid or mitigate negative impacts and to enhance the positive benefits of the proposed projects; and ▪ Provide an Environmental Management Programme (EMPr) for the relevant phases of the proposed projects. The Draft BA Report was released to all Interested and/or Affected Parties (I&APs), Organs of State and relevant stakeholders for a 30-day review period, which extended from 29 June 2026 to 29 July 2026. All comments submitted during the 30-day review period have been incorporated and responded to in the Comments and Responses Report included as Appendix G (Part 4), and addressed, as applicable and where relevant, in this Final BA Report. This Final BA Report has been submitted to the National Department of Forestry, Fisheries and the Environment (DFFE) for decision-making.	
Prepared for:	Veroniva (Pty) Ltd	
Prepared by:	Council for Scientific and Industrial Research (CSIR):	
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Mapping:	Dhiveshni Moodley and Rinae Tsedu (CSIR)	
Specialists:	Johann Lanz; Corné Niemandt; Russell Tate; Albert Froneman; Dr Megan Loftie-Eaton; Graham Young; Dr Jayson Orton; Dr John Almond; Tony Barbour; Schalk van der Merwe; Iris Wink; Kaylin Erasmus; Zita Saal; Hardy Luttig; Jaco Pretorius; and Debbie Mitchell	
Formatting and Desktop Publishing:	Magdel van der Merwe, DTP Solutions	
Date:	September 2026	
DFFE Reference No:	▪ Project 1 – Veroniva BESS: 14/12/16/3/3/1/3320 ▪ Project 2 – Veroniva EGI: 14/12/16/3/3/1/3321	
To be cited as:	CSIR, 2026. Basic Assessment for the Proposed Development of a Battery Energy Storage System (BESS), 132 kV Loop-In-Loop-Out (LILO) Power Line from the BESS to existing Eskom infrastructure, and associated infrastructure, near Polokwane, within the Polokwane Local Municipality, Capricorn District Municipality, Limpopo. Final Basic Assessment Report. CSIR Report Number: CSIR/SPLS/Ems/ER/2026/0036/A	
References for Photos Used in Report Cover Pages	▪ Google Earth (2026). Aerial Imagery of the Eskom Witkop Main Transmission Substation. Accessed: April 2026. ▪ AfriAvian Environmental (Pty) Ltd (2025). Drone Imagery of the proposed Veroniva BESS and EGI site. Imagery Date: November 2025. ▪ My Broadband [Trusted in Tech] (2025). *Biggest battery storage systems in South Africa*. Imagery of the operational Scatec Kenhardt Solar PV and BESS developments in the Northern Cape. Accessed: April 2026. https://mybroadband.co.za/news/energy/581983-biggest-battery-storage-systems-in-south-africa.html	

	▪ How Stuff Works (No Date). *How Broadband Over Powerlines Works*. Imagery of a power line. Accessed: April 2026. https://computer.howstuffworks.com/bpl.htm ▪ Mark Thomas and Associates Electrical Engineers [MTAEE] (2022). What is a Substation. Imagery of a substation. Accessed: April 2026. https://mtaee.com/what-is-a-substation/

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Key changes made from the Draft BA Report that was issued for I&AP, Stakeholder and Organ of State Review from 29 June 2026 to 29 July 2026

	Change made – Yes (denoted by ✓) or N/A (denoted by ■)																								
	Chapters														Appendices										
Key change description	**Summary**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**
The term “Draft BA Report” has been updated to “Final BA Report”, where applicable.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓							✓	✓	✓	✓	✓	
Updated with additional information regarding the status and progress made on the BA Process, i.e. proof of submission of the Applications for EA to the DFFE during the Draft BA Report stage (Appendix G.5), as well as DFFE’s acknowledgment of receipt (Appendix G.5).	✓	✓				✓															✓					
Updated with details of the Public Participation Process undertaken, including status of comments received from key stakeholders and status of the Amended Application for EA. Added correspondence and proof of correspondence sent to stakeholders for the Draft BA Report release (Appendix G.4); comments received from stakeholders during the 30-day review of the Draft BA Report (Appendix G.6); Stakeholder Meetings (Appendix G.7); Comments and Responses Report (Appendix G.8).	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓										✓					
Summary feedback on the comments raised during the 30-day review period on the Draft BA Report (Chapter 5).						✓																				
Updated the database of I&APs, Stakeholders and Organs of State to reflect additions and updates.																				✓						
Additional coordinate points provided for the key project infrastructure as a supplementary mechanism to address comment from the DFFE Integrated Environmental Authorisations (IEA) Directorate. No changes made to the actual infrastructure locations.			✓	✓														✓							
Clarification and reiteration that both Access Road Options A and B are acceptable for authorisation, that the 32 m buffer is not a no disturbance buffer, but rather a precautionary terrestrial ecological planning buffer to identify the area in which the additional mitigation is required. This was to address comments raised by the DFFE IEA Directorate.	✓				✓						✓	✓										✓	✓	✓	✓	
Updated Chapter 11, Chapter 12, Chapter 13, EMPrs, and Appendix E.2 (Terrestrial Biodiversity and Species Assessment) with mitigation recommendations provided by Stakeholders during the 30-day comment period (i.e. DFFE IEA, DFFE Biodversity Conservation, DFFE Directorate: Forest Resource Protection (Limpopo), and the Capricorn District Municipality), where relevant. The additional mitigation recommendations are also noted in Appendix G.8 (Comments and Responses Report) and mainly relate to 1) the need for a protected tree walk down before vegetation clearance and licence/permit application to identify individuals that are affected; 2) management of fauna encountered during construction; and 3) recommendations for the management of game farm animals during construction and operations, as well as the fencing requirements for game farm animals.	✓	✓										✓	✓	✓							✓	✓	✓	✓	✓	
Updated Chapter 11, Chapter 12, Chapter 13, EMPrs, and Appendix E.4 (Avifauna Assessment) with mitigation recommendations provided by Stakeholders during the 30-day comment period (i.e. DFFE IEA, DFFE Biodversity Conservation, DFFE Directorate: Forest Resource Protection (Limpopo), and VulPro), where relevant. The additional mitigation recommendations are also noted in Appendix G.8 (Comments and Responses Report) and mainly relate to 1) Avoiding the removal of mature indigenous trees that provide potential nesting, roosting, or foraging habitat as far as practicable; 2) recommendations for replacement of Bird Flight Diverters that display failure or malfunctioning; and 3) recommendations for monitoring of bird fatalities and reporting.	✓	✓										✓	✓	✓							✓	✓	✓	✓	✓	
Updated the combined layout map for BESS and EGI to indicate the seep wetland crossing point, and conceptual diagram of the seep wetland crossing included.			✓															✓								
Correction of the distance from the proposed project infrastructure to the Kuschke Nature Reserve					✓													✓								

	Change made – Yes (denoted by ✓) or N/A (denoted by)																								
	Chapters														Appendices										
Key change description	**Summary**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**
Added a letter from the Office of the Regional Land Claims Commissioner (RLCC) Limpopo, within the Department of Land Reform and Rural Development (DLRRD) to the Project Applicant confirming that Veroniva BESS (Pty) Ltd has complied with Section 11 (7) (aA) of the Restitution of Land Rights Act (Act 22 of 1994, as amended) and that the RLCC Limpopo does not have any objection to the intention to lease and develop a portion of Portion 5 of Farm Snymansdrift 738 LS. Relevant notes regarding this are included in Chapter 5.						✓																				✓

Note from the CSIR: If sections are not mentioned in the above table, this means that either there have been no changes or no major changes to these sections.

SUMMARY TABLE OUTLINING WHICH CHAPTERS OF THE COMBINED BA REPORT ARE APPLICABLE TO THE VERONIVA BESS PROJECT AND/OR THE VERONIVA EGI PROJECT

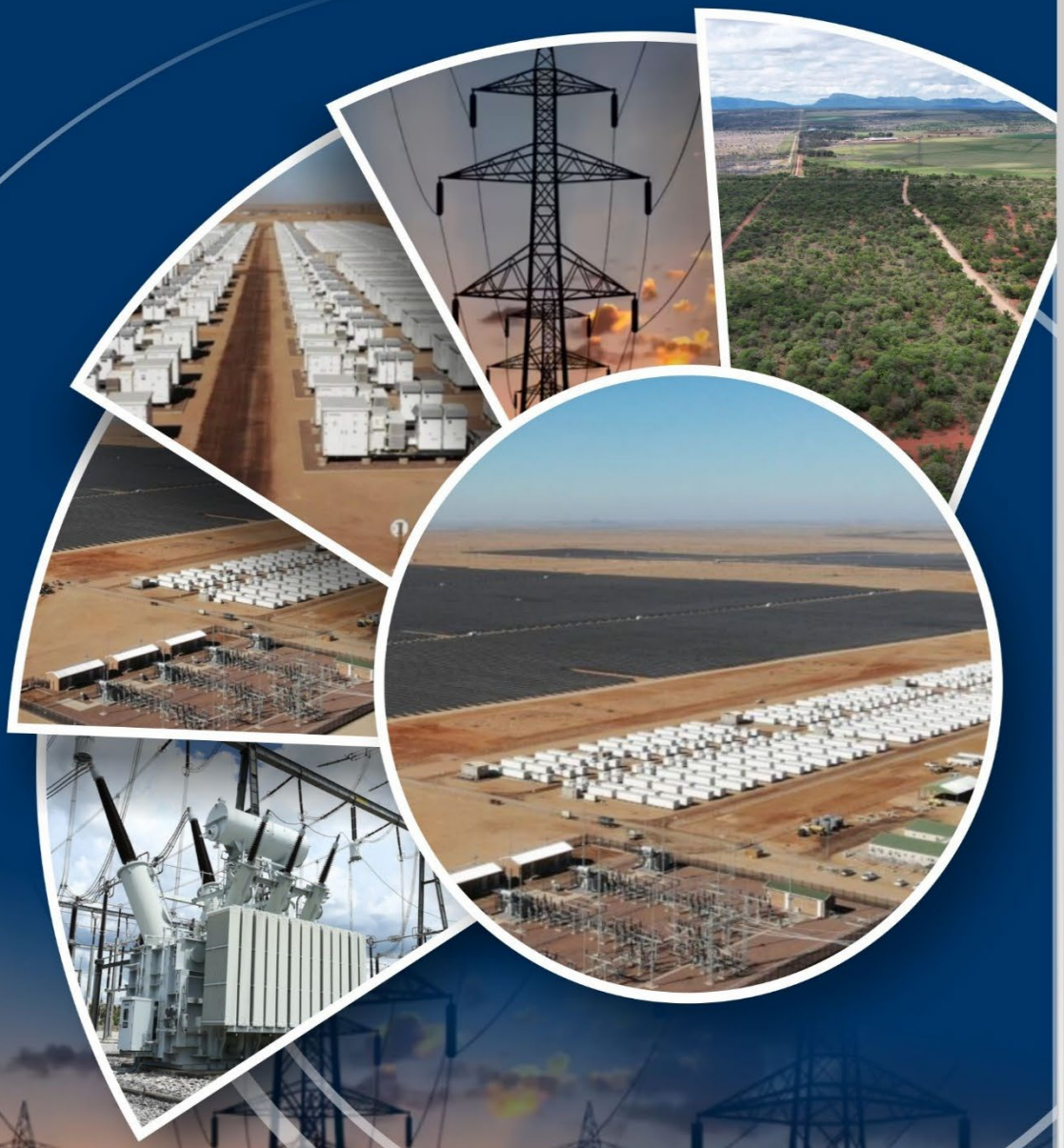
Note from the CSIR: Combined reporting has been approved by the Competent Authority. Therefore, one BA Report has been compiled to address both projects i.e. Project 1 (Veroniva BESS) and Project 2 (Veroniva EGI)

PART A: MAIN REPORT		INFORMATION WITHIN APPLICABLE TO BOTH BESS AND EGI	INFORMATION WITHIN APPLICABLE TO BESS ONLY	INFORMATION WITHIN APPLICABLE TO EGI ONLY
Chapter 0	Executive Summary	**X**		
Chapter 1	Introduction	**X**		
Chapter 2	Project Description for the BESS Project		**X**	
Chapter 3	Project Description for the EGI Project			**X**
Chapter 4	Description of the Affected Environment	**X**		
Chapter 5	Approach to the BA Process and Public Participation	**X**		
Chapter 6	Listed Activities for the BESS Project		**X**	
Chapter 7	Listed Activities for the EGI Project			**X**
Chapter 8	Screening Tool Specialist Assessment Recommendations for the BESS Project		**X**	
Chapter 9	Screening Tool Specialist Assessment Recommendations for the EGI Project			**X**
Chapter 10	Description of Alternatives	**X**		
Chapter 11	Impact Assessment for the BESS Project		**X**	
Chapter 12	Impact Assessment for the EGI Project			**X**
Chapter 13	Conclusions and Recommendations	**X**		

BASIC ASSESSMENT REPORT

Basic Assessment for the Proposed Development of a Battery Energy Storage System (BESS), 132 kV Loop-In-Loop-Out (LILO) Power Line from the BESS to existing Eskom infrastructure, and associated infrastructure, near Polokwane, within the Polokwane Local Municipality, Capricorn District Municipality, Limpopo

EXECUTIVE SUMMARY



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EXECUTIVE SUMMARY

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1. INTRODUCTION AND PROJECT LOCALITY

Veroniva (Pty) Ltd (the Project Developer, hereafter referred to as Veroniva), is proposing the development of a Battery Energy Storage System (BESS) Facility, Electricity Grid Infrastructure (EGI), and associated infrastructure, near Polokwane within the Polokwane Local Municipality, Capricorn District Municipality, Limpopo (Figure A). The projects are collectively referred to as the Veroniva BESS and EGI development.

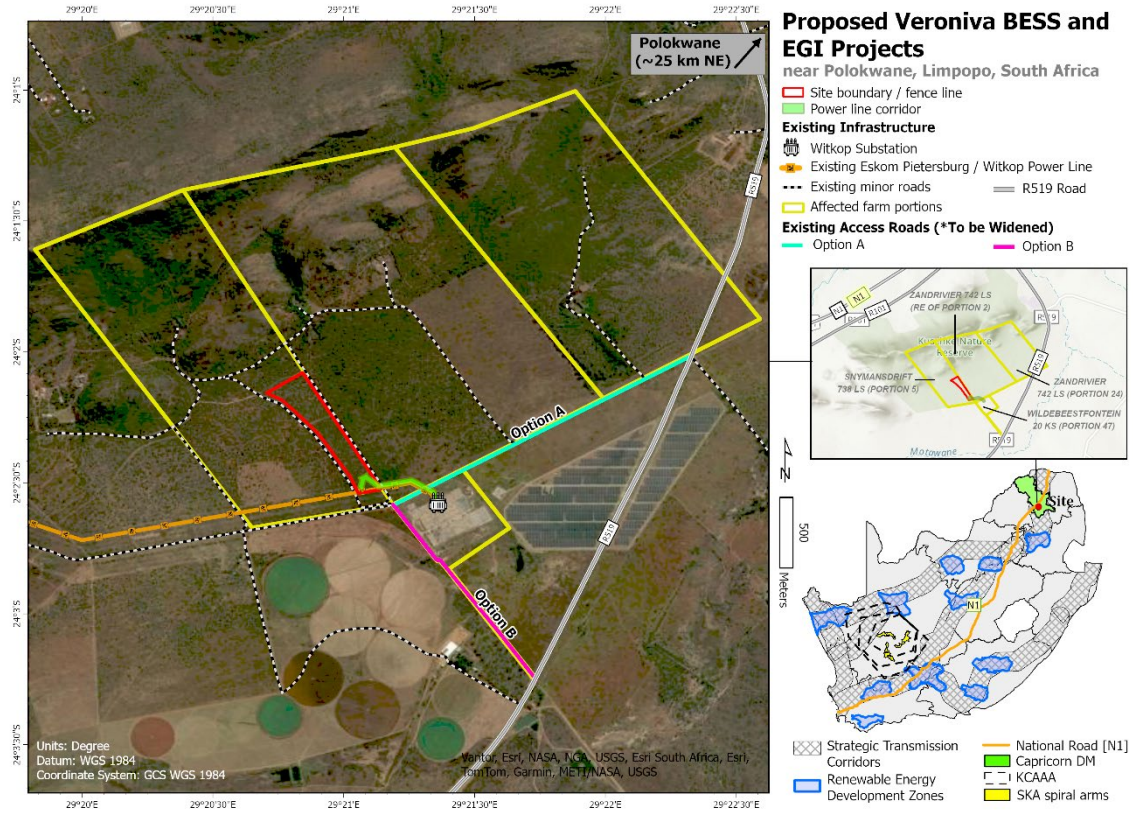


Figure A: Locality Map for the proposed Veroniva BESS (Project 1) and Veroniva EGI (Project 2) development near Polokwane in Limpopo

The proposed projects are not located within any of the Renewable Energy Development Zones (REDZs) that were gazetted in Government Notice (GN) 114 on 16 February 2018; and GN 144 on 26 February 2021; however, are located within the International Strategic Transmission Corridor that was gazetted in GN 113 on 16 February 2018.

The proposed BESS will store and dispatch energy when required and intends to form part of one of the upcoming rounds of the Battery Energy Storage Independent Power Producers Procurement Programme (BESIPPPP) and will therefore buy and sell electricity from and to Eskom under a Power Purchase Agreement, should the proposed development receive Environmental Authorisation (EA) and preferred bidder status. The BESS will have a range of associated infrastructure and is proposed to connect to the existing Eskom Pietersburg / Witkop 1 power line via a dedicated 132 kV Loop-In-Loop-Out (LILO) power line. To accommodate the BESS, the existing Eskom Pietersburg / Witkop 1 power line, from the proposed LILO to the Eskom Witkop Main Transmission Substation (MTS), may require upgrading.

One Basic Assessment (BA) Report has been prepared, and it is proposed that each project will receive its own separate EA (should it be granted). The following projects are being proposed:

- **PROJECT 1**: The proposed development of a BESS and associated infrastructure (Veroniva BESS);
- **PROJECT 2**: The proposed development of a 132 kV Overhead LILO Power Line from the BESS to existing Eskom infrastructure, and associated infrastructure (Veroniva EGI).

2. REPORT COMBINATION

A request to combine the Environmental Assessment reporting, for Projects 1 and 2, in terms of Regulation 11 (4) of the 2014 National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) Environmental Impact Assessment (EIA) Regulations (as amended), and the issuing of multiple EAs in terms of Regulations 25 (1) and (2) was discussed with the National Department of Forestry, Fisheries and the Environment (DFFE) at the Pre-Application Meeting on 06 March 2026. A letter was submitted to the DFFE to request for the combination and issuing of multiple EAs on 13 March 2026. The DFFE approved the request for combination and multiple EAs (should they be granted) in a letter dated 20 March 2026, sent via email on the same date.

The reporting structure indicated in Figure B has been used to undertake a consolidated assessment process and to ensure that the potential environmental impacts of each activity, in relation to the location at which they will take place, are considered. The combined reporting process reduces the administrative aspects on the Case Officer and reduces the number of reports that need to be reviewed by Interested and/or Affected Parties (I&APs), while still maintaining high levels of environmental rigour and clear reporting.

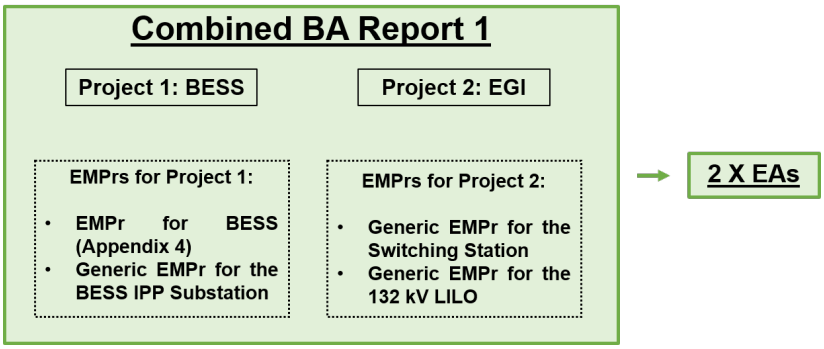


Figure B: Environmental Assessment Reporting Structure

Therefore, one combined report has been compiled for the BESS and EGI projects (i.e. Projects 1 and 2) and it is proposed that two separate EAs will be issued (should they be granted).

Note: The information throughout this Executive Summary applies equally to each of the projects addressed in the BA Report (i.e. Project 1 (Veroniva BESS) and Project 2 (Veroniva EGI)), unless where mentioned otherwise.

3. COMPETENT AUTHORITY AND APPLICANT

The Competent Authority for the proposed projects is the DFFE. The Project Applicants are listed below for both projects:

- Project 1: Veroniva BESS and associated infrastructure - Veroniva BESS (Pty) Ltd; and
- Project 2: Veroniva EGI and associated infrastructure - Veroniva BESS (Pty) Ltd.

4. NEED FOR THE BA AND APPROACH

The proposed projects trigger the need for an EA in terms of the 2014 NEMA EIA Regulations (as amended). In terms of the 2014 NEMA EIA Regulations (as amended), a BA Process is required for the proposed projects, and combined reporting has accordingly been approved by the DFFE (as noted above).

Chapter 6 (for Veroniva BESS – Project 1) and Chapter 7 (for Veroniva EGI – Project 2) of this BA Report contains a detailed list of activities, which are triggered by each project and the various project components and thus forms part of this BA Process. Listed below are the key listed activities triggered per project (Table A).

Table A. Key Listed Activities Per Project

Project	Listing Notice, Listed Activity and Description
Project 1: Veroniva BESS and associated infrastructure	**GN R327 (Listing Notice 1), Activity 27**: The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.
Project 2: Veroniva EGI and associated infrastructure	**GN R327 (Listing Notice 1), Activity 11 (i):** The development of facilities or infrastructure for the transmission and distribution of electricity (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.

The purpose of the BA Process is to identify, assess and report on any potential impacts the proposed projects, if implemented, may have on the receiving environment. The BA Process therefore needs to show the Competent Authority and the Project Applicant what the consequences of their choices will be in terms of impacts on the biophysical and socio-economic environment and how such impacts can be, as far as possible, enhanced or mitigated and managed as the case may be.

5. PUBLIC PARTICIPATION PROCESS AND CURRENT BA STAGE (I.E. FINAL BA REPORT)

The Public Participation Process (PPP) for this BA Process was undertaken in compliance with Chapter 6 of the 2014 NEMA EIA Regulations (as amended). An integrated PPP was followed for the proposed projects. The Draft BA Report was released to all I&APs, Organs of State and relevant stakeholders for a 30-day review period, which extended from 29 June 2026 to 29 July 2026.

The Draft BA Report was uploaded to the project website (i.e., https://www.csir.co.za/environmental-impact-assessment) and Google Drive for potential and registered I&APs to access it. Written notification of the commencement of the BA Process and the availability of the Draft BA Report for comment was sent to all stakeholders included on the project database via email, where email addresses were available. This notification was sent at the commencement of the 30-day review period on the Draft BA Report and included information on the proposed projects and notification of the availability of the reports. Various reminder emails were also sent to the stakeholders. Refer to Appendix G.4 (Part 2) of this Final BA Report for correspondence sent to stakeholders for the release of the Draft BA Report and follow up/reminders. Copies of all written comments received during the 30-day review period on the Draft BA Report have been included in Appendix G.6 (Part 3) of this Final BA Report. These comments have also been incorporated and responded to into a detailed Comments and Responses Report, included in Appendix G.8 (Part 4) of this Final BA Report, and addressed, as applicable and where relevant, in the Final BA Report.

The Final BA Report (i.e., this report) has been submitted to the DFFE, in accordance with Regulation 19 (1) (a) of the 2014 NEMA EIA Regulations (as amended), for decision-making.

6. BA PROJECT TEAM

In accordance with Regulation 12 (1) of the 2014 NEMA EIA Regulations (as amended), the Council for Scientific and Industrial Research (CSIR) Environmental Management Services (EMS) group was appointed to undertake the required Environmental Assessment Process.

The project team, which is involved in this BA Process, is listed in Table B below. This team includes several specialists who have extensive experience in conducting specialist studies for BESS and EGI projects in South Africa. The specialist studies relevant to the proposed Veroniva BESS and Veroniva EGI projects (i.e. Projects 1 and 2, respectively) are also indicated in Table B below. The term “N/A” in the table below indicates that the specialist study in question is not relevant to that specific project. Chapter 8 (for the Veroniva BESS – Project 1) and Chapter 9 (for the Veroniva EGI – Project 2) also includes motivation for not undertaking certain studies identified by the Screening Tool.

Table B. Project Team for the BA Process

NAME	ORGANISATION	ROLE/STUDY TO BE UNDERTAKEN	PROJECT 1 – BESS	PROJECT 2 – EGI
Environmental Management Services (CSIR)				
Paul Lochner (*Registered EAP* (2019/745))	CSIR	EAP, Technical Advisor and Quality Assurance	✓	✓
Rohaida Abed (*Pr.Sci.Nat.* and *Registered EAP* (2021/4067))	CSIR	EAP and Project Manager	✓	✓
Suvasha Ramcharan *(Cert.Sci.Nat. and Candidate EAP (2023/6896))*	CSIR	Project Officer	✓	✓
Dhiveshni Moodley (*Pr.Sci.Nat.*)	CSIR	Senior GIS Specialist	✓	✓
Rinae Tsedu *(Candidate EAP (2022/6210))*	CSIR	Junior GIS Specialist	✓	✓

NAME	ORGANISATION	ROLE/STUDY TO BE UNDERTAKEN	PROJECT 1 – BESS	PROJECT 2 – EGI
Helen Antonopoulos *(Cand.Sci.Nat.)*	CSIR	Public Participation Specialist	✓	✓
Specialists				
Johann Lanz (*Pr.Sci.Nat.)*	SoilZA	Agriculture and Soils Compliance Statement	✓	✓
Corné Niemandt *(Pr.Sci.Nat.)*	Bios Diversitas Consultants	Terrestrial Biodiversity Assessment, Terrestrial Plant Species Compliance Statement, and Terrestrial Animal Species Compliance Statement	✓	✓
Russell Tate *(Pr.Sci.Nat.)*	Tate Environmental Specialist Services	Aquatic Biodiversity and Species Impact Assessment	✓	✓
Albert Froneman *(Pr.Sci.Nat.)* Dr Megan Loftie-Eaton *(Pr.Sci.Nat.)*	AfriAvian Environmental (Pty) Ltd	Avifauna Impact Assessment	✓	✓
Graham Young (*SACLAP Registered*)	Graham Young Landscape Architect	Visual Impact Assessment	✓	✓
Dr Jayson Orton (*APHP Member; ASAPA CRM Section Member*)	ASHA Consulting (Pty) Ltd	Heritage Impact Assessment (Archaeology and Cultural Landscape)	✓	✓
Dr John Almond *(PSSA and APHP Member)*	Natura Viva cc	Palaeontology Letter of Exemption (*Site confirmed very low to low sensitivity*)	✓	✓
Tony Barbour Schalk van der Merwe	Tony Barbour Environmental Consulting	Socio-Economic Impact Assessment	✓	N/A
Iris Wink (*Pr Eng*)	iWink Consulting	Traffic Impact Assessment	✓	N/A
Kaylin Erasmus (*Cand.Sci.Nat.*) Zita Saal (*Pr.Sci.Nat.*)	GEOSS South Africa (Pty) Ltd	Geohydrology Impact Assessment	✓	N/A
Hardy Luttig (*Pr.Sci.Nat.*)[1] Jaco Pretorius	GEOSS South Africa (Pty) Ltd	Geotechnical Letter of Professional Opinion	✓	✓
Debbie Mitchell *(Pr Eng)*	Ishecon (Pty) Ltd	Battery Storage High Level Safety, Health and Environment Risk Assessment	✓	N/A
Rinae Tsedu (*Candidate EAP (2022/6210)*) Helen Antonopoulos *(Cand.Sci.Nat.)* Rohaida Abed *(Pr.Sci.Nat.* and *Registered EAP (2021/4067))*	CSIR	Civil Aviation Site Sensitivity Verification	✓	✓
Rinae Tsedu (*Candidate EAP (2022/6210)*) Helen Antonopoulos *(Cand.Sci.Nat.)* Rohaida Abed *(Pr.Sci.Nat.* and *Registered EAP (2021/4067))*	CSIR	Defence Site Sensitivity Verification	✓	✓

[1] Note that this specialist resigned from GEOSS at the end of August 2026.

The specialist assessments comply with Appendix 6 of the 2014 NEMA EIA Regulations (as amended), or the Assessment Protocols published in GN 320 on March 2020; or the Assessment Protocols published in GN 1150 on October 2020 (as amended). However, the BESS High Level Safety, Health and Environment Risk Assessment serves as a technical report, the Palaeontology and Geotechnical studies respectively take the form of a Letter of Exemption and Letter of Professional Opinion, and therefore the aforementioned legislation is not applicable.

7. STUDY AREA

The study area or preferred site for the proposed Veroniva BESS, EGI, 132 kV LILO power line, and associated infrastructure (i.e. Projects 1 and 2) covers approximately 65 hectares (ha). The 65 ha study area includes an approximately 18 ha EGI assessment corridor. Overall, the study area for Projects 1 and 2 covers 65 ha, as well as external access roads leading to the site that may need to be widened / upgraded (Figure C).

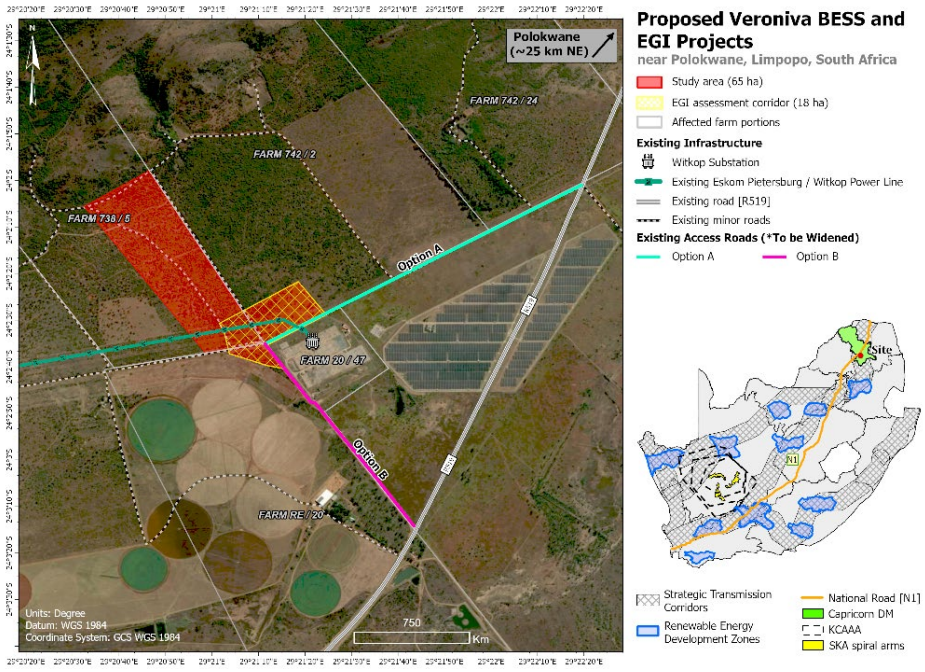


Figure C: Study Area for the proposed Veroniva BESS (Project 1) and Veroniva EGI (Project 2) development

As part of the BA Process, the full extent of the study area was assessed by the specialists in order to identify environmental sensitivities and no-go areas. The preferred site serves as the study area for this BA Process. Therefore, the terms “site” and “study area” are used synonymously in this BA Report.

8. PROJECT DESCRIPTION

8.1. Veroniva BESS – Project 1

Note: The information below applies to Project 1 (Veroniva BESS) only.

A summary of the key components of the proposed Veroniva BESS (Project 1) and technical information is described in Table C below.

Table C. Summary of the components and associated infrastructure for Veroniva BESS (Project 1)

Component	Description
Battery Energy Storage System (BESS)	
BESS Area/Facility	▪ Technology: Lithium-Ion BESS ▪ Total Footprint: Approximately 15 ha (including associated infrastructure) ▪ Height: Between 5 m and 10 m ▪ The BESS area will include the following sub-components: o BESS Units; o Laydown Area; o Independent Power Producer (IPP) Substation; o Transformer at the IPP Substation; o Overhead cables at the IPP Substation; o Operational and Maintenance (O&M) Office, including Ablutions; o External Access Roads; o Internal Roads; o Medium Voltage (MV) cables between BESS Units; o Internal cables at the BESS Facility; o Fencing and Security; and o Parking Area.
BESS Sub-Components *(to be located within the 15 ha area of the overall BESS Facility (except for external access roads))*	
BESS Units	▪ This will include battery packs or containers, with an area of approximately 8 ha, and height up to 5 m.
Laydown Area	▪ Footprint: Approximately 3.2 ha
On-site Substation – BESS IPP Substation Section	▪ This includes the BESS IPP Substation, which includes all the high voltage infrastructure leading up to the Point of Connection (i.e. the Project Applicant's section of the proposed on-site substation). This will be maintained by the IPP. ▪ Footprint: Approximately 0.5 ha ▪ Height: Up to 15 m ▪ Capacity: 33 kV to 132 kV ▪ Transformer at the IPP Substation: o Capacity: Ranges above 33 kV o Height: Up to 2 m

Component	Description
	▪ Cables at the IPP Substation: o Placement: Overhead o Capacity: Ranges above 33 kV o Height: Up to 12 m
Operational and Maintenance (O&M) Office	▪ Maximum height: Up to 5 m ▪ Footprint: Approximately 0.3 ha ▪ The BESS O&M Office will also include Ablution facilities.
External Access Roads	▪ New Access Roads: Where new access roads are required, these will be 4 - 8 m wide. The bell mouth at the access road leading to the IPP substation will extend up to approximately 19 m wide to accommodate turning vehicles. The main access road towards the east of the proposed infrastructure, leading to the BESS, extends approximately 1 095 m in length. The access road leading to the IPP substation extends approximately 20 m in length. ▪ Existing Access Roads: Existing roads will be used as far as practically achievable. Where existing roads are used, they may need to be upgraded. ▪ The proposed project site can be accessed via various existing main roads and gravel roads. Direct access to the proposed project will be taken from the R519. There are two options for external access to the proposed project site, as follows: o **Option A**: A gravel road off the R519, which leads to the proposed project site via Farm 742/2 and Farm 742/24, along the northern edge of the Witkop Solar Facility and Eskom Witkop Main Transmission Substation (MTS). The existing road will be used and widened as needed. The existing road currently extends 3 – 4 m wide, and will be widened to about 4 – 8 m. The access point at the R519 may need to be upgraded as close as possible to a 90° approach to improve visibility for construction vehicles. The length of Access Road Option A extends approximately 2 195 m. o **Option B**: A tarred road off the R519 (which leads directly to the Eskom Witkop MTS), and a paved road just before the Eskom Witkop MTS gate (slight left), up until the access gate to Farm 738/5. The tarred section of the access road (towards the Eskom Witkop MTS gate) is about 5 m wide currently and may require some work to enable large/heavy construction vehicles to pass each other safely in two-way traffic. The grassed shoulders of this section of the access road will be converted to a hardened gravel surface (~1 m each side). This will enable large/heavy construction vehicles to safely make space for oncoming traffic, and the grass shoulders can be re-instated once the construction phase is concluded. This section of the access road needs to be monitored regularly for any damage. The paved section of the access road (along the western edge of the Eskom Witkop MTS) is currently about 3 – 4 m wide. It is expected to require some widening to up to 6 m wide to allow large construction vehicles to pass each other. Details will be confirmed during detailed design. Alternative to widening, a more temporary measure for consideration, is installing gravel shoulders on each side of the road, which then needs to be monitored and repaired

Component	Description
	for the duration of the construction, and re-instated at the end of construction. The length of Access Road Option B extends approximately 1 520 m.
Internal Roads	▪ Details: New internal gravel roads will need to be established within the BESS Facility area. ▪ Width: Up to 4 m
Medium Voltage (MV) cables between the BESS Units	▪ Placement: Buried/Ducted ▪ Capacity: Ranges from 1 kV up to 33 kV ▪ Depth: Up to 2 m
Internal cables in the BESS Facility	▪ Placement: Buried/Ducted ▪ Capacity: Ranges from 1 kV up to 33 kV ▪ Depth: Up to 2 m
Fencing of the BESS Facility and Security	▪ Type: Palisade, mesh, game fencing, or fully electrified ▪ Height: Up to 5 m ▪ Security: Access to the BESS Facility will be managed and monitored by an appointed security service provider.
Parking Area	▪ A parking area will be established at the BESS Facility for staff
Storm water channels	▪ Details to be confirmed once the Engineering, Procurement and Construction (EPC) contractor has been selected and the design is finalised. Where necessary, a detailed storm water management plan would need to be developed.
Water Requirements	▪ Approximately 350 m^3 to 450 m^3 of water is estimated to be required per year for the construction phase. ▪ Approximately 200 m^3 to 300 m^3 of water is estimated to be required per year for the operational phase. ▪ Water requirements during the decommissioning phase are expected to be the same as the construction phase. ▪ Potential sources: Existing boreholes on site or from the Local Municipality via trucks.
Construction Period	▪ 12 - 24 months
Operational Period	▪ Once the commercial operation date is achieved, the proposed BESS will store and dispatch electricity for a minimum period of 10 to 30 years.

8.2. Veroniva EGI – Project 2

Note: The information below applies to Project 2 (Veroniva EGI) only.

A summary of the key components of the proposed Veroniva EGI (Project 2) and technical information is described in Table D below.

Table D. Summary of the components and associated infrastructure for Veroniva EGI (Project 2)

Component	Description
On-site Substation - Switching Station Section	▪ The section includes all the high voltage infrastructure extending from the Point of Connection (i.e. Eskom's section of the proposed on-site substation, which is also referred to as the **Switching Station**). This will include the section that will be transferred from the Independent Power Producer (IPP) to Eskom after construction. ▪ Footprint: Approximately 0.5 ha ▪ Height: Up to 15 m ▪ Capacity: 132 kV
132 kV Overhead Loop-In-Loop-Out (LILO) Power Line on Portion 5 of Farm Snymansdrift 738 LS	▪ The LILO power line will be routed from the switching station to the Eskom Pietersburg / Witkop 1 Power Line. ▪ Capacity: 132 kV ▪ Height: Up to 37 m ▪ Length: Up to 1 km ▪ Servitude: 40 m wide ▪ Pylon specifications: o Type: Lattice structures and/or monopoles. o Tower: Self-supporting and Angle Strain. o Foundation: ▪ Lattice: The size of the footprint area for the base of the tower foundation will be approximately 49 m^2 (7 m by 7 m). The working area required around a structure position is 225 m^2. ▪ Monopole: The size of the footprint area for the base of the tower foundation will range from 0.36 m^2 to 2.25 m^2. The minimum working area required around a structure position is 20 m x 20 m. o Span Length: 200 m – 300 m
Upgrade of the Eskom Pietersburg / Witkop 1 Power Line (on Portion 5 of Farm Snymansdrift 738 LS, Remaining Extent of Portion 2 of Farm Zandrivier 742 LS, and Portion 47 of Farm Wildebeestfontein 20 KS)	▪ In order to accommodate the BESS, the existing Eskom Pietersburg / Witkop 1 Power Line, from the LILO to the Eskom Witkop Main Transmission Substation (MTS), needs to be upgraded. ▪ The upgrading will entail developing of new pylons and/or replacing existing pylons. Where there are existing pylon structures, it is proposed to excavate next to the existing pylon structures and cast new foundations for new pylons adjacent to the existing pylons. ▪ The upgrading will occur within the existing power line servitude. ▪ Pylon specifications: o Type: Lattice structures and/or monopoles. o Tower: Self-supporting and Angle Strain. o Foundation: ▪ Lattice: The size of the footprint area for the base of the tower foundation will be approximately 49 m^2 (7 m by 7 m). The working area required around a structure position is 225 m^2. ▪ Monopole: The size of the footprint area for the base of the tower foundation will range from 0.36 m^2 to 2.25 m^2. The minimum working area required around a structure position is 20 m x 20 m. o Span Length: 200 m – 300 m
Work at the Eskom Witkop MTS	▪ Where needed, associated electrical infrastructure will be installed or upgraded at the Eskom Witkop MTS (including but not limited to feeders, busbars, and platform extension).

Component	Description
Service Road	▪ Details: A new gravel service road will need to be established below the LILO on Portion 5 of Farm Snymansdrift 738 LS. ▪ Width: Up to 4 m ▪ Length: Approximately 200 m ▪ Note: Existing service roads (on Remaining Extent of Portion 2 of Farm Zandrivier 742 LS) will be used for the section of the line from the LILO to the Eskom Witkop MTS.
External Access Roads	▪ The EGI project will be developed after the BESS project has commenced (should relevant approval be granted), and as such will make use of the main access roads developed for the BESS project. ▪ However, a new section of road leading from the main BESS access road to the Switching Station will be developed. This will be 4 - 8 m wide, however, the bell mouth at the intersection with the main BESS access road will extend up to approximately 19 m wide to accommodate turning vehicles. The access road leading to the Switching Station extends approximately 20 m in length.
Storm water channels	▪ Details to be confirmed once the Engineering, Procurement and Construction (EPC) contractor has been selected and the design is finalised. Where necessary, a detailed storm water management plan would need to be developed.
Laydown Area	▪ The EGI project will be developed after the BESS project has commenced (should relevant approval be granted), and as such will make use of the laydown area developed for the BESS project.
Water Requirements	▪ Approximately 100 m^3 of water is estimated to be required per year for the construction phase. ▪ Water requirements during the decommissioning phase are expected to be the same as the construction phase. ▪ Potential sources: Existing boreholes on site or from the Local Municipality via trucks.
Construction Period	▪ 6 - 24 months

9. SUMMARY OF IMPACT ASSESSMENT FINDINGS AND MANAGEMENT ACTIONS

Note: The information in this section applies equally to Project 1 (Veroniva BESS) and Project 2 (Veroniva EGI), unless where stated otherwise.

Based on the detailed specialist assessments, various potential impacts have been identified for the Veroniva BESS (Project 1) and Veroniva EGI (Project 2). A summary of the **main impacts** identified is provided in Table E. Note that several mitigation and enhancement measures have been provided by the specialists, however only selected key measures are noted in the table below for direct and indirect impacts only. In general, some of the mitigation and enhancement measures of the most significant impacts (post-mitigation and post-enhancement) have been included in Table E. In Table E, enhancement measures are specified, and all other measures are mitigation.

The specialist studies included in Appendix E of this BA Report, and the summary with Impact Assessment tables included in Chapters 11 (for Project 1 – Veroniva BESS) and Chapter 12 (for Project 2 – Veroniva EGI) of this BA Report, contain all the detailed mitigation and enhancement

measures. The recommended mitigation and enhancement measures have also been included in the EMPrs in Appendix H to Appendix K of this BA Report.

Table E. Summary of Key Impacts that were identified and assessed during the BA Phase as part of the Specialist Studies, including key recommended mitigation and enhancement measures

Specialist Study	Key Impacts Identified	Recommended Mitigation Measures (and Enhancement Measures, where specified)
Appendix E.1: Agriculture Compliance Statement	**Note: The information presented below applies equally to Project 1 – Veroniva BESS and Project 2 – Veroniva EGI.** **Negative Direct Impact:** **Construction, Operation and Decommissioning Phases:** ▪ Loss of future agricultural production potential	**Note: The information presented below applies to Project 1 – Veroniva BESS only.** **Construction, Operation and Decommissioning Phases:** ▪ No mitigation measures are required for the protection of agricultural production potential on the site because the development poses negligible degradation risk to agricultural resources. ▪ Erosion to surrounding farmland poses minimal threat but should nevertheless always be managed by standard erosion control measures where necessary. ▪ For the proposed Independent Power Producer (IPP) substation, there are no additional mitigation measures required, over and above what has already been included in the Generic Environmental Management Programme (EMPr) for substations (Government Notice (GN) 435). **Note: The information presented below applies to Project 2 – Veroniva EGI only.** **Construction, Operation and Decommissioning Phases:** ▪ For the proposed Loop-In-Loop-Out (LILO) and switching station, there are no additional mitigation measures required, over and above what has already been included in the Generic EMPrs for power lines and substations (GN 435).
Appendix E.2: Terrestrial Biodiversity, Terrestrial Plant Species, and Terrestrial Animal Species	**Note: The information presented below applies to Project 1 – Veroniva BESS only.** **Negative Direct Impacts:** **Construction Phase:** ▪ Fragmentation and loss of natural habitat and sensitive features.	**Note: The mitigation measures below apply equally to Veroniva BESS (Project 1) and Veroniva EGI (Project 2), except where a mitigation measure is specifically indicated as applying to a specific project only.** **Construction Phase:** ▪ Infrastructure must be excluded within High sensitivity areas including their buffer zones (where applicable). Suitable habitat for Sensitive species 1252, Sensitive species 550, Sensitive species 1248, *Prunus africana* and

Specialist Study	Key Impacts Identified	Recommended Mitigation Measures (and Enhancement Measures, where specified)
	▪ Impacts on national and provincial protected plant Species of Conservation Concern (SCC). ▪ Disturbance, loss or displacement impacts on animal SCC. ▪ Introduction and spread of alien invasive species. ▪ Increased erosion and soil compaction. ▪ Littering and general pollution. **Operational Phase:** ▪ Direct and indirect faunal disturbance and mortality. ▪ Increase in alien invasive species. ▪ Loss of species composition and diversity. ▪ Littering and general pollution. **Decommissioning Phase:** ▪ Loss of habitat. ▪ Direct and indirect disturbance and mortality of fauna. ▪ Waste related impacts associated with disposal of used parts. ▪ Increased alien invasive species. **Note: The information presented below applies to Project 2 – Veroniva EGI only.** **Negative Direct Impacts:** **Construction Phase:** ▪ Fragmentation and loss of natural habitat and sensitive features. ▪ Impacts on national and provincial protected plant SCC. ▪ Disturbance, loss or displacement impacts on animal SCC. ▪ Introduction and spread of alien invasive species. ▪ Increased erosion and soil compaction. ▪ Littering and general pollution. **Operational Phase:** ▪ Increase in alien invasive species.	*Kinixys lobatsiana* have been identified as high sensitivity. Note: Avoidance of high sensitivity areas have already been achieved by the layout determined and assessed in the BA Phase for the BESS and EGI footprint. Access Road Option A traverses a seep wetland that is assigned high sensitivity and a precautionary 32 m terrestrial ecological planning buffer; however, this is acceptable provided that the recommended mitigation measures are implemented. Note the 32 m terrestrial ecological planning buffer is not a no-go buffer. ▪ Avoid rocky areas. Note: This has already been achieved by the layout determined and assessed in the BA Phase. ▪ A comprehensive Animal Search and Rescue must be undertaken for the approved layout by a suitably qualified zoological / ecological specialist prior to vegetation clearance and disturbance. ▪ A comprehensive Plant Search and Rescue must be undertaken for the approved layout by a suitably qualified botanical / ecological specialist prior to vegetation clearance and disturbance. ▪ Where the approved layout designs impact on provincially protected individuals, permit applications are required for either the relocation or destruction of provincially protected species (Schedule 12 (Protected Plants) of the Limpopo Environmental Management Act, 2003 (Act 7 of 2003)). ▪ Where the approved layout designs impact on protected tree species, including *Prunus africana* and *Sclerocarya birrea ssp. afra*, a licence / permit is required in terms of the National Forests Act (Act 84 of 1998). ▪ Prior to vegetation clearance and submission or finalisation of the relevant National Forests Act (Act 84 of 1998) licence application, undertake a detailed protected-tree walkdown of the final authorised construction footprint, including affected access-road widening areas; georeference, identify and quantify all protected trees that may be affected, and overlay these records with the final layout to determine the individuals requiring a licence. ▪ Speed restrictions (40 km / hour is recommended) should be in place to reduce the amount of dust caused by vehicle movement along the roads, and to reduce possible fauna fatalities with vehicle collisions.

Specialist Study	Key Impacts Identified	Recommended Mitigation Measures (and Enhancement Measures, where specified)
	▪ Loss of species composition and diversity. ▪ Littering and general pollution. **Decommissioning Phase:** ▪ Loss of habitat. ▪ Increased alien invasive species. **Note: The information presented below applies equally to Project 1 – Veroniva BESS and Project 2 – Veroniva EGI.** **Negative Cumulative Impacts:** **Construction and Decommissioning Phases**: ▪ Loss of CBAs, natural vegetation and sensitive features. **Construction, Operational and Decommissioning Phases:** ▪ Disturbance, mortality and/or displacement of plant and animal SCC. ▪ Introduction and spread of alien invasive species.	▪ Establish and implement an ongoing roadkill monitoring programme (inclusive of wildlife collisions record keeping) to inspect roads for injured and deceased fauna (including tortoises) due to the movement of vehicles to and from site. ▪ If trends or patterns emerge from the data (e.g., high incidence of tortoise mortality), appoint a suitably qualified specialist to develop and implement corrective actions. ▪ **Veroniva BESS**: Widening and upgrading of access roads must be confined to the minimum technically feasible footprint. ▪ **Veroniva BESS**: No indiscriminate vegetation grubbing, side-casting, laydown, turning of vehicles, or stockpiling may take place outside the demarcated road prism (for the upgrading of Access Road Option A). ▪ **Veroniva BESS**: All protected plant individuals and any protected trees along road edges must be avoided where possible. **Operational Phase:** ▪ **Veroniva BESS**: Persecution of fauna species must be reduced through education and awareness campaigns. No physical harm, collection or hunting to any species may occur. ▪ **Veroniva BESS**: Minimise use of infrastructure that could be used for nesting and making structures less suitable by selecting specific designs or using perch deterrents (most effective are long spikes with sloped base, dense spikes facilitate nest-building). ▪ Alien vegetation, within the development footprints, should be removed from the site and disposed of at a registered waste disposal site. ▪ Refuelling may only take place in an appropriate, designated bunded area, if relevant. ▪ Any spillages must be reported immediately and dealt with appropriately. ▪ Spill kits must be available on site in case of accidental spillage. **Decommissioning Phase:** ▪ **Veroniva BESS**: All disturbed areas and infrastructure must be dismantled and restored to the previous state of habitat structure (both rocks and vegetation) as far as possibly practical.

Specialist Study	Key Impacts Identified	Recommended Mitigation Measures (and Enhancement Measures, where specified)
		▪ **Veroniva BESS**: Decommissioning works should avoid sensitive breeding/migration periods where possible. ▪ **Veroniva EGI**: Implement appropriate rehabilitation measures to return the vegetation to sustainable, productive use that was representative of the respective vegetation type prior to the commencement of construction. ▪ Follow an alien and invasive species control and monitoring plan in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004, as amended) (NEMBA) by implementing appropriate control methods during and after decommissioning.
Appendix E.3: Aquatic Biodiversity and Species Impact Assessment	**Note: The information presented below applies to Project 1 – Veroniva BESS only.** **Negative Impacts:** **Construction Phase:** ▪ Water and aquatic habitat impacts stemming from: o site access and clearing of vegetation in working areas (indirect impact). o the establishment of laydown yards/construction camps (indirect impact). o the excavations and earthworks for the setting of the access roads, culverts, BESS and associated structures and stormwater controls (For Access Road Option A) (direct impact). o the excavations and earthworks for the setting of access roads, BESS structures and stormwater controls (For Access Road Option B) (indirect impact). o the storage and use of chemicals, fuels and oils (indirect impact). o the alteration of surface drainage and hydrological processes (indirect impact). **Operational Phase:** ▪ Water and aquatic habitat impacts stemming from: o the storage and use of chemicals, fuels and oils (indirect impact).	**Note: The mitigation measures below apply equally to Veroniva BESS (Project 1) and Veroniva EGI (Project 2), except where a mitigation measure is specifically indicated as applying to a specific project only.** **Construction, Operational and Decommissioning Phases:** ▪ The implementation of an effective Stormwater Management Plan, which includes: o An analysis on peak flow changes between the pre- and post-development landscapes. o Layouts and design of stormwater infrastructure. o The effective attenuation of the expected increased hydrological conditions. ▪ **Veroniva EGI:** Clean and dirty surface water separation must be put into place via standard best practice methods. ▪ **Veroniva EGI:** No discharge of domestic water must occur if possible. Domestic water must be reused for dust suppression. **Note: The mitigation measures below apply to Project 1 – Veroniva BESS only.** **Construction, Operational and Decommissioning Phases:** ▪ Mitigation actions and infrastructure design must ensure compliance in the implementation of the standards and measures stipulated in GN 4167 (published in Government Gazette 49833 of 8 December 2023) as specified in the Aquatic Biodiversity and Species Assessment.

Specialist Study	Key Impacts Identified	Recommended Mitigation Measures (and Enhancement Measures, where specified)
	○ the alteration of surface drainage and hydrological processes (for Access Road Option A and Option B) [Direct impact for Option A and indirect impact for Option B]. **Decommissioning Phase:** ▪ Water and aquatic habitat impacts stemming from: ○ site access and clearing of vegetation in working areas (indirect impact). ○ the establishment of laydown yards/camps for decommissioning activities (indirect impact). ○ the excavations and earthworks for the removal of BESS, associated structures and stormwater controls (indirect impact). ○ the storage and use of chemicals, fuels and oils (indirect impact). ○ the alteration of surface drainage and hydrological processes (indirect impact). **Note: The information presented below applies to Project 2 – Veroniva EGI only.** **Negative Indirect Impacts:** **Construction Phase:** ▪ Water and aquatic habitat impacts stemming from: ○ site access and clearing of vegetation in working areas. ○ the establishment of laydown yards/construction camps. ○ excavations and earthworks for the setting of EGI structures, associated structures and stormwater controls. ○ the storage and use of chemicals, fuels and oils. ○ the alteration of surface drainage and hydrological processes. **Operational Phase:** ▪ Water and aquatic habitat impacts stemming from:	**Construction Phase:** ▪ Where culverts are required, it is recommended that these are spread across the wetland units and not directed through single culverts. ▪ Where drifts are utilised, it is recommended that these structures are reinforced with erosion control measures that protect downstream riverine substrates and riparian habitats. ▪ Areas where construction is to take place must be clearly demarcated. Any areas not demarcated must be avoided. ▪ No vehicles shall enter watercourse buffer zones outside of construction footprints. ▪ Drainage channels constructed for the access roads must be constructed so as not to result in erosion. ▪ General stormwater management practices should be included in the design phase and implemented during the construction phase of this project. ▪ Following the completion of the construction phase, all construction materials and debris should be removed and disposed of in a suitable area. An inspection should be completed within a four week period after the construction phase is completed. **Operational Phase:** ▪ A clear stormwater management plan for hardened surfaces must be implemented. ▪ Monitoring of instream structures should be undertaken on an annual basis.

Specialist Study	Key Impacts Identified	Recommended Mitigation Measures (and Enhancement Measures, where specified)
	○ the storage and use of chemicals, fuels and oils during maintenance activities at the switching station and LILO. ○ the alteration of surface drainage and hydrological processes. **Decommissioning Phase**: ▪ Water and aquatic habitat impacts stemming from: ○ site access and clearing of vegetation in working areas. ○ the establishment of laydown yards/camps for decommissioning activities. ○ the excavations and earthworks for the removal of EGI structures and associated structures and stormwater controls. ○ the storage and use of chemicals, fuels and oils. ○ the alteration of surface drainage and hydrological processes. **Note: The information presented below applies equally to Project 1 – Veroniva BESS and Project 2 – Veroniva EGI.** **Negative Cumulative Impacts:** **Construction, Operational and Decommissioning Phases:** ▪ Water and aquatic habitat impacts stemming from the alteration of surface drainage and hydrological processes.	
Appendix E.4: Avifauna Impact Assessment	**Note: The information presented below applies to Project 1 – Veroniva BESS only.** **Negative Direct Impacts:** **Construction Phase:** ▪ Displacement of avifauna due to disturbance associated with construction of the BESS and associated infrastructure. ▪ Displacement of avifauna due to habitat loss associated with the construction (and presence) of the BESS and associated infrastructure. **Operational Phase:**	**Note: The mitigation measures below apply equally to Veroniva BESS (Project 1) and Veroniva EGI (Project 2), except where a mitigation measure is specifically indicated as applying to a specific project only.** **Construction Phase:** ▪ The All-Infrastructure Exclusion Zones must be strictly adhered to. Note: This has been achieved in the layout assessed in this BA Phase. ▪ Measures to control noise and dust must be applied according to current best practice in the industry. ▪ Construction activity must be restricted to the immediate footprint of the infrastructure.

Specialist Study	Key Impacts Identified	Recommended Mitigation Measures (and Enhancement Measures, where specified)
	▪ Mortality of avifauna due to electrocution at the on-site substation complex (IPP substation) and/or on the medium voltage overhead power lines (if any). ▪ Mortality of avifauna (power line sensitive species) due to collisions with the overhead sections (if any) of the internal medium voltage reticulation network. **Decommissioning Phase:** ▪ Displacement of avifauna due to disturbance associated with the decommissioning of the BESS and associated infrastructure. **Note: The information presented below applies to Project 2 – Veroniva EGI only.** **Negative Direct Impacts:** **Construction Phase:** ▪ Displacement of avifauna due to disturbance associated with the construction of the EGI. ▪ Displacement of avifauna due to habitat loss associated with the construction (and presence) of the EGI. **Operational Phase:** ▪ Mortality of EGI sensitive avifauna due to electrocutions in the switching station and/or on the 132 kV overhead LILO and upgraded power line. ▪ Mortality of EGI sensitive avifauna due to collisions with the 132 kV overhead LILO and upgraded power line. **Decommissioning Phase:** ▪ Displacement of avifauna due to disturbance associated with the decommissioning of the EGI. **Note: The information presented below applies equally to Project 1 – Veroniva BESS and Project 2 – Veroniva EGI.**	▪ The removal of mature indigenous trees must be avoided as far as practicable, particularly where such trees provide potential nesting, roosting, or foraging habitat for avifaunal species and other fauna. Where avoidance is not feasible, mitigation measures recommended by the Terrestrial Biodiversity and Botanical Specialists must be implemented. ▪ To reduce the risk of birds (especially owls) becoming entangled in fences, it is recommended that for any new fences being constructed, at least the top two strands should be smooth wire (not barbed) and the spacing between at least the top two wires should be increased to a minimum of 300 mm. The entanglement risk will also be reduced by ensuring that the wires are correctly tensioned. **Operational Phase:** ▪ **Veroniva BESS:** In instances where the medium voltage cables cannot be buried due to technical constraints or for example, to accommodate other environmental sensitivities, a bird-friendly pylon design must be used, and appropriate mitigation must be implemented pro-actively for pylon structures e.g., insulation of live components to prevent electrocutions on terminal structures and pole transformers. A registered South African Council for Natural Scientific Professions (SACNASP) Avifaunal Specialist must sign off on the design for the pylons and overhead lines. ▪ **Veroniva BESS:** In instances where the medium voltage cables cannot be buried, Bird Flight Diverters (BFDs) must be fitted in a staggered configuration (on the earth wire and conductor) to all overhead lines for the full length according to the applicable Eskom Engineering Instruction (5 m apart for medium voltage power lines). Light and dark coloured devices must be alternated to provide contrast against both dark and light backgrounds, respectively. These devices must be installed as soon as the conductors are strung. ▪ **Veroniva EGI:** A bird-friendly pylon design must be used for the 132 kV LILO and power line upgrade (i.e. for the new proposed LILO and the section of the existing Eskom Witkop-Pietersburg 1 Line that will be upgraded from the LILO to the Eskom Witkop Main Transmission Substation), with appropriate mitigation measures for complicated pole

Specialist Study	Key Impacts Identified	Recommended Mitigation Measures (and Enhancement Measures, where specified)
	Negative Cumulative Impacts: **Construction Phase:** ▪ Displacement of avifauna due to disturbance associated with construction activities of all the renewable energy, EGI, BESS and other key projects in the 30 km radius. ▪ Displacement of avifauna due to habitat loss associated with the construction activities and presence of all the renewable energy, EGI, BESS and other key projects in the 30 km radius. **Operational Phase:** ▪ Mortality of priority avifauna due to electrocutions in the substations, on the associated internal medium voltage overhead lines (if any), and on the high voltage overhead power lines of all the renewable energy, EGI, BESS and other key projects in the 30 km radius. ▪ Mortality of priority avifauna due to collisions on the associated internal medium voltage overhead lines (if any) and on the high voltage overhead power lines of all the renewable energy, EGI, BESS and other key projects in the 30 km radius. **Decommissioning Phase:** ▪ Displacement of priority species due to disturbance associated with decommissioning activities of all the renewable energy, EGI, BESS and other key projects in the 30 km radius.	structures (e.g., insulation of live components to prevent electrocutions on terminal structures and pole transformers), as recommended by the Avifaunal Specialist. ▪ **Veroniva EGI:** Monitor the electrocution mortality at the switching station monthly. Apply mitigation (insulation of live components) if electrocution of SCC happens more than once per annum. ▪ **Veroniva EGI:** BFDs must be fitted in a staggered configuration (on the earth wire and conductor) for the full length of the 132 kV LILO and power line upgrade (i.e. for the length of the new proposed LILO and the section of the existing Eskom Witkop-Pietersburg 1 Line that will be upgraded from the LILO to the Eskom Witkop Main Transmission Substation) according to the applicable Eskom Engineering Instruction (15 m apart for high voltage power lines). These devices must be installed as soon as the conductors are strung. ▪ VulPro must be notified immediately if any vulture is negatively impacted by collisions or electrocutions. **Decommissioning Phase:** ▪ **Veroniva BESS:** Decommissioning activity should as far as possible be restricted to the immediate footprint of the infrastructure. ▪ **Veroniva BESS:** Maximum use must be made of existing access roads, and the construction of new roads must be avoided as far as practical/only developed where absolutely needed. ▪ Measures to control noise and dust must be applied according to current best practice in the industry.
Appendix E.5: Visual Impact Assessment	**Note: The information presented below applies equally to Project 1 – Veroniva BESS and Project 2 – Veroniva EGI.** **Negative Direct Impacts:** **Construction Phase:** ▪ Potential visual effect of construction activities.	**Note: The mitigation measures below apply equally to Veroniva BESS (Project 1) and Veroniva EGI (Project 2), except where a mitigation measure is specifically indicated as applying to a specific project only.** **Construction Phase:** ▪ With the preparation of the land within the full extent of the project site onto which activities will take place, the minimum amount of existing vegetation and topsoil should be removed.

Specialist Study	Key Impacts Identified	Recommended Mitigation Measures (and Enhancement Measures, where specified)
	Operational Phase: ▪ Effect of the operational activities and infrastructure on the landscape character and sense of place. **Decommissioning Phase:** ▪ Potential visual effect of decommissioning activities, and any remaining structures, platforms and disused roads on the landscape. **Negative Cumulative Impacts:** **Construction, Operational and Decommissioning Phases:** ▪ Potential combined visual effect of proposed Veroniva BESS, Veroniva EGI, and other developments in the 30 km radius (i.e. existing and proposed Eskom power lines and substations, and other approved, existing or proposed renewable energy facilities, BESS and EGI) seen together during construction, operational and decommissioning phases.	▪ Adopt responsible construction practices that strictly contain the construction / establishment activities to demarcated areas. **Operational Phase:** ▪ **Veroniva BESS:** Install light fixtures that provide precisely directed illumination to reduce light "spillage" beyond the immediate surrounds of the site, i.e. lights are to be aimed away from the nearby residences immediately south and south-west of the project site and the R519 access road. ▪ **Veroniva BESS:** Minimise the number of light fixtures to the bare minimum, including security lighting. ▪ **Veroniva BESS:** Avoid high pole top security lighting along the periphery of the site at the BESS area and use only lights activated on illegal entry to the site. ▪ **Veroniva EGI:** Ensure the EGI is properly maintained and kept free of alien vegetation. **Decommissioning Phase:** ▪ All equipment and structures to be dismantled and removed from the site. ▪ Disturbed soil must be vegetated to avoid prolonged exposure to wind and water erosion and to minimise dust generation. ▪ The entire site is to be replanted with natural vegetation indigenous to the study area.
Appendix E.6: Heritage Impact Assessment (Archaeology and Cultural Landscape)	**Note: The information presented below applies equally to Project 1 – Veroniva BESS and Project 2 – Veroniva EGI.** **Negative Direct Impacts:** **Construction Phase:** ▪ Potential impact on archaeology. ▪ Potential impact on graves. ▪ Potential impact on the cultural landscape. **Operational Phase:** ▪ Potential impact on the cultural landscape.	**Note: The mitigation measures below apply equally to Veroniva BESS (Project 1) and Veroniva EGI (Project 2).** **Construction Phase:** ▪ Report any chance finds to the South African Heritage Resources Agency (SAHRA) and/or an archaeologist. In the case of graves, protect chance finds *in situ* and appoint an archaeologist to exhume under an approved permit. ▪ Keep the construction duration as short as possible. **Operational Phase:** ▪ Take measures to reduce night-time light pollution from security lighting. ▪ Use moderate sized signage on public roads.

Specialist Study	Key Impacts Identified	Recommended Mitigation Measures (and Enhancement Measures, where specified)
	Decommissioning Phase: ▪ Potential impact on the cultural landscape. **Negative Cumulative Impacts:** **Construction, Operational and Decommissioning Phases:** ▪ Potential impact on archaeology. ▪ Potential impact on graves. ▪ Potential impact on the cultural landscape.	**Decommissioning Phase:** ▪ Minimise the duration of the decommissioning period. ▪ Ensure effective rehabilitation of all affected areas.
Appendix E.7: Palaeontology Letter of Exemption	**Note: The information presented below applies equally to Project 1 – Veroniva BESS and Project 2 – Veroniva EGI.** ▪ The study area has been confirmed as very low palaeo-sensitivity. Pending the unlikely discovery of substantial new fossil remains within the project area during the Pre-Construction or Construction Phases, no further specialist palaeontological studies, reporting or mitigation have been recommended or considered necessary for the proposed project. ▪ A Chance Fossil Finds Protocol has been included in the Letter of Exemption, which needs to be implemented by the responsible Environmental Control Officer (ECO) during the Construction Phase. ▪ The recommendations and Chance Fossil Finds Protocol have been included in the EMPrs.	**Note: The information presented below applies equally to Project 1 – Veroniva BESS and Project 2 – Veroniva EGI.** **Construction Phase:** ▪ The Chance Fossil Finds Protocol should be implemented by the ECO during the construction phase.
Appendix E.8: Socio-Economic Impact Assessment	**Note: The information presented below applies to Project 1 – Veroniva BESS only.** **Positive Direct Impacts:** **Construction Phase:** ▪ Creation of employment and business opportunities. **Operational Phase:** ▪ The establishment of infrastructure to improve energy security and support renewable sector.	**Note: The information presented below applies to Project 1 – Veroniva BESS only.** **Enhancement Measures:** **Construction Phase:** ▪ Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to the commencement of the construction phase. ▪ Where reasonable and practical, the proponent should appoint local contractors and implement a 'locals first' policy, especially for semi and low-skilled job categories.

Specialist Study	Key Impacts Identified	Recommended Mitigation Measures (and Enhancement Measures, where specified)
	▪ Creation of employment and business opportunities. ▪ Creation of socio-economic development opportunities. ▪ Benefits to the affected landowner. **Negative Direct Impacts:** **Construction Phase:** ▪ Increased safety and security risks and impact on farming operations associated with the construction related activities and presence of construction workers on the site. ▪ Increased risk of grass fires associated with construction related activities. ▪ Nuisance impacts, such as noise, dust, and safety, associated with construction related activities and vehicles. ▪ Loss of productive land. **Operational Phase:** ▪ Noise, health and safety risks. ▪ Visual impacts and associated impacts on sense of place. ▪ Impact on property values. ▪ Potential fire risk to irrigated crop areas and other operations. **Decommissioning Phase:** ▪ Socio-economic impacts associated with retrenchment, including loss of jobs, and source of income. **Note: The information presented below applies equally to Project 1 – Veroniva BESS and Project 2 – Veroniva EGI.** **Positive Cumulative Impacts:** **Construction and Operational Phases:** ▪ Cumulative impacts on the local economy.	▪ Before the construction phase commences the proponent should meet with representatives from the Polokwane Local Municipality (PLM) to establish the existence of a skills database for the area. If such a database exists, it should be made available to the contractors appointed for the construction phase. ▪ The proponent should liaise with the PLM with regards to the establishment of a database of local companies, specifically BBBEE companies, which qualify as potential service providers (e.g., construction companies, catering companies, waste collection companies, security companies etc.) prior to the commencement of the tender process for construction service providers. These companies should be notified of the tender process and invited to bid for project-related work. **Operational Phase:** ▪ Maximise the number of employment opportunities for local community members. ▪ Where feasible, training and skills development programmes for locals should be initiated prior to the initiation of the operational phase. ▪ Implement the rental agreement with the affected landowner for the BESS project (i.e. landowner of Farm Snymansdrift 738/5). ▪ The proponents should liaise with the PLM to identify projects that can be supported by Socio-Economic Development (SED) contributions. **Mitigation Measures:** **Construction Phase:** ▪ Investigate the option of installing CCTV cameras at key access points and along the boundary of the BESS site. ▪ Fence off the BESS site prior to the start of the construction phase. ▪ Contractors appointed by the proponent should provide daily transport for low and semi-skilled workers to and from the site. ▪ Develop a Code of Conduct for construction workers. The Code of Conduct should be signed by the proponent and the contractors before construction activities commence. ▪ Contractor should provide fire-fighting training to selected construction staff.

Specialist Study	Key Impacts Identified	Recommended Mitigation Measures (and Enhancement Measures, where specified)
	Negative Cumulative Impacts: **Operational Phase:** ▪ Cumulative impacts on sense of place and the landscape.	▪ Dust suppression measures should be implemented, such as ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers. **Operational Phase:** ▪ Ensure that the BESS and associated infrastructure are maintained regularly during the operational phase to ensure optimal operation. ▪ Implement recommendations of the Visual Impact Assessment undertaken for the proposed project. ▪ Provide fire-fighting training for selected operational personnel. ▪ Provide fire-fighting equipment on the site. ▪ Establish and maintain a firebreak around the perimeter of the BESS site. **Decommissioning Phase:** ▪ The proponent should ensure that retrenchment packages are provided for all staff retrenched when the BESS is decommissioned.
Appendix E.9: Traffic Impact Assessment	**Note: The information presented below applies to Project 1 – Veroniva BESS only.** **Negative Direct Impacts:** **Construction and Decommissioning Phases:** ▪ Increase in trips on external roads due to transport of components, material and labour, possibly leading to delays and road safety issues. ▪ Noise and dust pollution during transport and construction and decommissioning activities on site. ▪ Possible damage to road surfaces along the haulage routes (specifically near the site) caused by construction and decommissioning vehicles. **Operational Phase:** ▪ Slight increase in traffic due to permanent staff travelling to site, and irregular trips for water delivery and maintenance (i.e., exchange of batteries). The	**Note: The information presented below applies to Project 1 – Veroniva BESS only.** **Construction and Decommissioning Phases:** ▪ The delivery of components to the site should be staggered and trips spread across the day, as much as possible. ▪ All required widening and resurfacing of the bellmouth(s) on the R519 onto the access road (Option A and Option B) to site needs to be finalised before the start of actual project (based on required approvals). The exact dimensions for the widening can only be confirmed at the detailed design stage. The widening and re-surfacing will need to be in line with the relevant Authority's geometric guidelines, and will require necessary permits and approvals, as relevant. ▪ Regular maintenance of private gravel roads located within the site boundary (i.e. existing internal farm roads on Farm 738/5) that are used by and impacted on by the proposed development, by the Contractor during the

Specialist Study	Key Impacts Identified	Recommended Mitigation Measures (and Enhancement Measures, where specified)
	traffic generated during this phase is expected to have a nominal impact on the surrounding road network. **Note: The information presented below applies equally to Project 1 – Veroniva BESS and Project 2 – Veroniva EGI.** **Negative Cumulative Impacts:** **Construction Phase:** ▪ Further increase in trips on external roads due to transport of components, material and labour to site for several renewable energy, EGI, BESS and other projects within the 30 km radius. ▪ Additional dust pollution during transport and construction activities on site. ▪ Possible further damage to road surfaces along the haulage routes (specifically near the site) caused by construction vehicles.	construction phase and decommissioning phase, and by the Owner/Facility Manager during the operational phase, if required. ▪ Regular maintenance of the access roads to the site (i.e. **External Access Road Option A**: The gravel road off the R519, which leads to the proposed project site via Farm 742/2 and Farm 742/24, along the northern edge of the Witkop Solar Facility and Eskom Witkop MTS), by the Contractor during the construction phase and decommissioning phase, and by the Owner/Facility Manager during the operational phase, if required. For Option A, this must be maintained and repaired in accordance with the original pre-construction condition or left in a better condition. ▪ Regular maintenance of the access roads to the site (i.e. **External Access Road Option B**: The paved and tarred sections of the access road to the Eskom Witkop MTS off the R519, and towards the western edge of the substation), by the Contractor during the construction phase and decommissioning phase, and by the Owner/Facility Manager during the operational phase, if required. For Option B, this must be achieved under the guidance and approval of the road owner, i.e. Eskom.
Appendix E.10: Geohydrology Impact Assessment	**Note: The information presented below applies to Project 1 – Veroniva BESS only.** **Negative Direct Impacts:** **Construction Phase:** ▪ Potential lowering of the local groundwater table due to construction water requirements. ▪ Potential groundwater contamination from accidental construction spillages (hydrocarbons, concrete wash, untreated sanitation waste from onsite ablution facilities), direct contact with wet concrete during sub-surface foundation works and BESS-related firewater runoff (electrolytes/suppressants) during installation and commissioning. **Operational Phase:** ▪ Potential lowering of the local groundwater table due to operational water requirements.	**Note: The information presented below applies to Project 1 – Veroniva BESS only.** **Construction Phase:** ▪ The following mitigation measures only apply if groundwater is abstracted for the proposed project: o Boreholes must be correctly yield tested according to the National Standard (SANS 10299-4:2003, Part 4 – Test pumping of water boreholes). This includes a step test, constant discharge test and recovery monitoring. o Distribute abstraction across multiple boreholes to spread the hydraulic load and minimise drawdown (without increasing the volume). o Implement a groundwater monitoring programme prior to construction to establish a baseline, and continue monitoring throughout the construction phase to identify and respond to variances in groundwater levels or quality accordingly.

Specialist Study	Key Impacts Identified	Recommended Mitigation Measures (and Enhancement Measures, where specified)
	▪ Potential groundwater contamination from localised accidental spillages associated with the BESS infrastructure (liquid electrolytes or glycol-based coolants). **Decommissioning Phase:** ▪ Potential lowering of the local groundwater table due to decommissioning water requirements. ▪ Potential groundwater contamination from accidental spillages of hydrocarbons (oils and fuels) from heavy machinery, alongside the improper handling, storage or leakage of decommissioned waste materials. **Note: The information presented below applies equally to Project 1 – Veroniva BESS and Project 2 – Veroniva EGI.** **Negative Cumulative Impacts:** **Construction, Operational and Decommissioning Phases:** ▪ Potential lowering of the groundwater levels because of combined abstraction during the construction, operational and decommissioning phases for the Veroniva BESS and EGI facility and surrounding proposed or existing renewable energy, BESS and EGI projects. **Construction and Decommissioning Phases:** ▪ Potential impact on groundwater quality because of accidental oil, fuel or sewage spillages and/or concrete wash during the construction and decommissioning phases. This includes risks associated with the improper handling, storage or leakage of decommissioned waste materials. **Construction Phase:** ▪ Potential impact on groundwater quality because of foundation construction occurring below the water table during the construction phase. **Operational Phase:**	▪ Vehicles must be regularly serviced and maintained to check and ensure there are no leakages. ▪ Diesel fuel storage tanks, if required, should be above ground on an impermeable surface in a bunded area. **Operational Phase:** ▪ The following mitigation measures only apply if groundwater is abstracted for the proposed project: o Implement distributed abstraction across multiple boreholes to spread the hydraulic load and minimise drawdown (without increasing the volume). o Implement and continue to monitor groundwater throughout operations according to the groundwater monitoring programme, using baseline data to identify significant variances in groundwater levels or quality accordingly. o Implement and enforce water-saving techniques. ▪ Ensure that all chemicals stored or used on site have secondary containment systems in place with reliable leak detection. ▪ Hazardous waste products from the BESS, substations, maintenance buildings and ablution facilities must be appropriately removed and disposed of at licensed facilities. ▪ The BESS and substation to be positioned at least 50 m away from any existing boreholes. No boreholes were found within the 65 ha study area, or within the footprint of the External Access Road Options A and B, based on the Desktop Hydrogeological Assessment. ▪ BESS units must be installed on impermeable, concrete, level surfaces throughout the operational phase. The area should be designed using specific contouring to direct potential runoff away from sensitive zones and toward a designated collection area where temporary containments can be deployed during an emergency. ▪ Conduct annual physical integrity inspections of all foundation slabs and impermeable surfaces. Repair any cracks immediately to prevent sub-surface infiltration.

Specialist Study	Key Impacts Identified	Recommended Mitigation Measures (and Enhancement Measures, where specified)
	▪ Potential impact on groundwater quality due to the cumulative use of dust suppressants and cleaning agents within the region. While the Veroniva BESS will not have solar panels, the cumulative use of cleaning agents across 16 nearby solar facilities may contribute to this regional impact. ▪ Potential impact on groundwater quality because of accidental leaks or spillages of hazardous electrolytes (Lithium) and cooling fluids (Glycols) associated with the operational BESS units. Additionally, the combined potential for contaminated fire-water runoff from multiple sites during installation or emergencies may lead to large-scale infiltration of the regional aquifer.	**Decommissioning Phases:** ▪ Implement similar mitigation measures recommended for the construction phase, if groundwater is abstracted for the decommissioning phase. ▪ All decommissioned BESS units must be inspected for physical damage or leakage prior to removal. Damaged cells must be placed in specialised, chemical-resistant drums or leak-proof containers immediately to prevent electrolyte spills during transport. ▪ Decommissioned batteries must be stored in a covered, bunded and well-ventilated area to prevent exposure to rainwater.
Appendix E.11: Geotechnical Letter of Professional Opinion	**Note: The information presented below applies equally to Project 1 – Veroniva BESS and Project 2 – Veroniva EGI.** **Negative Direct Impacts:** **Construction Phase:** ▪ Displacement of geologic material resulting in soil erosion. **Construction, Operational and Decommissioning Phases**: ▪ Contamination of subsoils and loss of topsoil. **Operational and Decommissioning Phases**: ▪ Increased unnatural hard surfaces yielding increased runoff, potentially increasing erosion.	**Note: The information presented below applies equally to Project 1 – Veroniva BESS and Project 2 – Veroniva EGI.** **Construction Phase:** ▪ Development of a stormwater management plan by a qualified professional before construction is highly recommended. ▪ Installation of suitable systems to redirect water away from areas designated for the infrastructure. ▪ Implementation of safeguards during refuelling to protect soil from spillages, ensuring swift and proper disposal if incidents occur. **Operational Phase:** ▪ Similar to the construction phase, stormwater management planning by a qualified professional will be required. ▪ Diversion of water away from road layers and erected structures, similar to the construction phase. ▪ Replication of mitigation measures for spillages/leakages from the construction phase. **Decommissioning Phase:** ▪ Restoration of natural topography and land rehabilitation to near-natural state, including removal of foundations and hard surfaces, followed by proper backfilling.

Specialist Study	Key Impacts Identified	Recommended Mitigation Measures (and Enhancement Measures, where specified)
		▪ Use of locally sourced materials for reinstating and backfilling to ensure uniformity. ▪ Implementation of standard environmental management procedures for infrastructure.
Appendix E.12: Battery Energy Storage System (BESS) High Level Safety, Health and Environment (SHE) Risk Assessment	**Note: The information presented below only applies to Project 1 – Veroniva BESS.** Various risks were identified in terms of safety, health and the environment due to the proposed BESS. The BESS High Level SHE Risk Assessment identified risks, hazards, and consequences, such as, but not limited to: **Construction Phase:** ▪ Human Health - chronic exposure to toxic chemical or biological agents. Causes: Construction materials such as cement, paints, solvents, welding fumes, truck fumes etc. Consequences - Employee / contractor illness. ▪ Human Health - exposure to noise. Causes: Drilling, piling, generators, air compressors. Consequences - Adverse impact on hearing of workers. Possible nuisance factor in nearby areas. ▪ Human and Equipment Safety - exposure to fire radiation. Causes: Involvement in an external fire. Fire involving fuels used in construction vehicles or vehicles themselves (e.g., tyre fire). Fire due to uncontrolled welding or other hot-work. Consequences - Injuries due to radiation, especially amongst first responders and bystanders. Fatalities unlikely from the heat radiation as not highly flammable nor massive fire. ▪ Human and Equipment Safety - exposure to explosion over pressures. With solid state lithium containers, flammable gases generated by thermal run away reach explosive limits. Ignition on hot surfaces, static. Consequences - Potential fatalities amongst first responders. Damage to container, transport truck or other nearby items, e.g., other containers in the port. **Operational Phase:** ▪ Human and Equipment Safety - exposure to fire radiation. Causes: Power Conversion System (PCS) – direct current to alternative current cooling failure	**Note: The information presented below only applies to Project 1 – Veroniva BESS.** ▪ There are numerous different battery technologies but using one consistent battery technology system for the BESS installation would allow for ease of training, maintenance, emergency response and could significantly reduce risks. ▪ Where reasonably practicable, “state-of-the-art” battery technology should be used with all the necessary protective features, e.g., draining of cells during shutdown and standby-mode, full Battery Management System (BMS) with deviation monitoring and trips, leak detection systems. ▪ Ensure that the technical and system suggestions for managing and reducing risks, as specified in the assessment, specifically in terms of preventative and mitigative measures are included in the design. ▪ The overall design should be subject to a full Hazard and Operability Study (HAZOP) prior to finalisation of the design. ▪ Prior to importing any solid-state battery modules / containers into the country, the contractor should ensure that: o An Emergency Response Plan is in place that would be applicable for the full route from the ship to the site. This plan would include details of the most appropriate emergency response to fires both while the units are in transit and once, they are installed and operating. o An End-of-Life plan is in place for the handling, repurposing or disposal of dysfunctional, severely damaged batteries, modules and containers. ▪ The site layout and spacing between lithium solid-state containers should be such that it mitigates the risk of a fire or explosion event spreading from one container to another.

Specialist Study	Key Impacts Identified	Recommended Mitigation Measures (and Enhancement Measures, where specified)
	electrical fire. Consequences - Fire starts in PCS or another section or room and spreads to battery area. ▪ Human and Equipment Safety - exposure to explosion over pressures. Cause 1 - Transformer shorting / overheating / explosion. Cause 2 - Flammable gases generated by thermal run away reach explosive limits. Ignition on hot surfaces, static. Lithium Cobalt Oxide generates oxygen during decomposition – escalation. Consequences - Potential fatalities amongst first responders. Damage to container or other nearby items, e.g., another container.	▪ In order to limit the possibility of domino failures from the BESS onto transformers and to limit direct impacts of any fire or explosion on the substation, the BESS should be separated from the substation by at least 20 m, or greater if specified in local or International Standards. ▪ Suitable separation must be ensured between the BESS containers and other on-site facilities such as transformers, any high voltage overhead power lines etc. In this regard there are National Fire Protection Agency (NFPA - USA) and Eskom guidelines. Separation from office areas (i.e. the O&M building) should be at least 25 m to avoid direct damage from possible explosions and fires, and possibly be 50 m to avoid minor impacts explosion debris. ▪ Under certain weather conditions, the noxious smoke from a potential fire in a lithium BESS container could travel some distance from the unit. Close to the source of the smoke, the concentration of toxic gases may be high enough to cause irreversible harmful effects. The location of the BESS needs to ensure sufficient separation distance from public facilities and residences (500 m) / main public roads (150 m). The proposed location of the Veroniva BESS is suitable in this regard. ▪ In terms of aquatic risks, lithium-ion BESS fires produce toxic smoke, and fire fighting may result in contamination of firewater runoff. Linked to this, the proposed location for the BESS should be more than 50 m from existing boreholes and more than 100 m from aquatic features. The current chosen location of the BESS meets these separation requirements. There are no boreholes and aquatic features within the BESS and EGI development footprints. ▪ The proposed location of the BESS is acceptable from both a toxic smoke risk and aquatic pollution perspective. ▪ Finally, it is suggested once the BESS technology has been chosen and more details of the final design are available, the necessary updated Risk Assessments should be in place (prior to commencement, after Environmental Authorisation and other necessary approvals are granted (should such be granted)).

10. SUMMARY OF THE KEY IMPACT ASSESSMENT FINDINGS

10.1 Veroniva BESS – Project 1

Note: The information below applies to Project 1 (Veroniva BESS) only.

Table F provides a summary of the post-mitigation and post-enhancement impact assessment (direct and indirect impacts) for the proposed Veroniva BESS (Project 1). Some impacts were not identified, or are considered insignificant, or could not be measured empirically at the time of assessment.

Table F. Overall Impact Significance with the Implementation of Mitigation / Enhancement Measures for Direct and Indirect Negative and Positive Impacts for Veroniva BESS (Project 1)

Specialist Assessment	Construction Phase		Operational Phase		Decommissioning Phase	
DIRECT NEGATIVE IMPACTS						
Agriculture	Low		Low		Low	
Terrestrial Biodiversity, Terrestrial Plant Species, and Terrestrial Animal Species	Low		Low		Low	
Aquatic Biodiversity and Species	Low		Very Low		Not identified and/or not applicable	
Avifauna	Low	Moderate	Low	Moderate	Low	
Visual	Low		Very Low		Very Low	
Heritage (Archaeology and Cultural Landscape)	Very Low		Very Low		Very Low	
Palaeontology	Insignificant and/or not identified and/or not applicable		Insignificant and/or not identified and/or not applicable		Insignificant and/or not identified and/or not applicable	
Socio-Economic	Low		Very Low	Low	Very Low	
Traffic	Low		Very Low		Low	
Geohydrology	Very Low	Low	Very Low	Low	Very Low	Low
Geotechnical	Very Low	Low	Very Low	Low	Very Low	Low
INDIRECT NEGATIVE IMPACTS						
Aquatic Biodiversity and Species	Very Low		Very Low		Very Low	
DIRECT POSITIVE IMPACTS						
Socio-Economic	Moderate		Low	Moderate	Insignificant and/or not identified and/or not applicable	

Based on the findings of the detailed specialist studies, which are included in Appendix E of this BA Report, the following is concluded for the proposed Veroniva BESS (Project 1), as per the summary in Table F:

- With the implementation of mitigation measures, this project is considered to have an **overall Low to Very Low direct negative environmental impact, with only a few moderate negative environmental impacts for Avifauna during the construction and operational phases.** The moderate significance impacts for avifauna relate to displacement of avifauna due to habitat loss associated with the construction and presence of the BESS and associated infrastructure (during the construction phase), and collision mortality of power line sensitive avifauna species due to collisions with any overhead sections of the internal medium voltage reticulation network (during the operational phase). These are not fatal flaws, and the Avifauna specialists have recommended adequate mitigation measures in this regard.

- With the implementation of mitigation measures, this project is considered to have an **overall Very Low indirect negative environmental impact in terms of Aquatic Biodiversity and Species during all phases.**

- With the implementation of enhancement measures, this project is considered to have an **overall Moderate to Very Low positive socio-economic impact for construction and operations**. According to the Socio-Economic Impact Assessment (Appendix E.8 of the BA Report), the establishment of the proposed Veroniva BESS and EGI, and other renewable energy facilities in the vicinity of the Eskom Witkop MTS will create socio-economic opportunities for the Polokwane Local Municipality. The positive cumulative opportunities include creation of employment, skills development and training opportunities, and downstream business opportunities. Given the limited economic opportunities in the area this would represent a positive opportunity.

10.2 Veroniva EGI – Project 2

Note: The information below applies to Project 2 (Veroniva EGI) only.

Table G provides a summary of the post-mitigation and post-enhancement impact assessment (direct and indirect impacts) for the proposed Veroniva BESS (Project 1). Some impacts were not identified, or are considered insignificant, or could not be measured empirically at the time of assessment.

Table G. Overall Impact Significance with the Implementation of Mitigation / Enhancement Measures for Direct and Indirect Negative and Positive Impacts for Veroniva EGI (Project 2)

Specialist Assessment	Construction Phase		Operational Phase		Decommissioning Phase	
DIRECT NEGATIVE IMPACTS						
Agriculture	Very Low		Very Low		Very Low	
Terrestrial Biodiversity, Terrestrial Plant Species, and Terrestrial Animal Species	Low	Very Low	Low		Low	Very Low
Avifauna	Low		Low	Moderate	Low	
Visual	Very Low		Very Low		Very Low	
Heritage (Archaeology and Cultural Landscape)	Very Low		Very Low		Very Low	
Palaeontology	Insignificant and/or not identified and/or not applicable		Insignificant and/or not identified and/or not applicable		Insignificant and/or not identified and/or not applicable	
Geotechnical	Very Low	Low	Very Low	Low	Very Low	Low
INDIRECT NEGATIVE IMPACTS						
Aquatic Biodiversity	Very Low		Very Low		Very Low	

Based on the findings of the detailed specialist studies, which are included in Appendix E of this BA Report, the following is concluded for the proposed Veroniva EGI (Project 2), as per the summary in Table G:

- With the implementation of mitigation measures, this project is considered to have an **overall Low to Very Low direct negative environmental impact, with only a few moderate negative environmental impacts for Avifauna during the operational phase.** The moderate significance impacts for avifauna relate to collision mortality of power line sensitive avifauna species due to collisions with the 132 kV overhead LILO and upgraded power line (during the operational phase). This is not a fatal flaw, and the Avifauna specialists have recommended adequate mitigation measures in this regard.

- With the implementation of mitigation measures, this project is considered to have an **overall Very Low indirect negative environmental impact in terms of Aquatic Biodiversity and Species during the construction, operational and decommissioning phases.**

11. OVERALL IMPACT ASSESSMENT AND REASONED OPINION FROM THE EAP

Note: The information in this section equally applies to Project 1 (Veroniva BESS) and Project 2 (Veroniva EGI), unless where mentioned otherwise.

The information presented above contributes to this overall environmental impact statement and reasoned opinion from the Environmental Assessment Practitioner (EAP) as to whether the proposed projects should or should not be authorised, including any conditions that should be made in respect of the authorisation (should it be granted).

Based on the findings of the detailed specialist assessments and technical studies, which all recommend that the proposed projects can proceed and should be authorised by the DFFE, the proposed projects are considered to have an **overall Low to Very Low negative environmental impact, and an overall Moderate to Low positive socio-economic impact** (with the implementation of respective mitigation and enhancement measures).

In addition, cumulative impacts have been assessed by all relevant specialists. It is concluded that no cumulative impacts are considered to be fatal flaws. Based on the findings of the detailed specialist assessments and technical studies, the proposed projects are considered to have an overall Low to Very Low negative cumulative environmental impact (with some Moderate negative cumulative impacts), and an overall highly significant positive cumulative socio-economic impact (with the implementation of respective mitigation and enhancement measures).

The proposed projects will take place within the development footprint on the preferred project site. The development footprint and buildable areas avoid the no-go sensitive features identified and mapped by the respective specialists, where relevant and applicable. Linear infrastructure traverses an area of high sensitivity due to avifauna electrocution and collision risk (as identified by the Avifauna specialists), and a seep wetland (as identified by the Terrestrial Biodiversity and Aquatic Biodiversity specialists), however the relevant specialists have confirmed that this is acceptable with recommended mitigation measures. The project layouts are final, avoid the no-go sensitivities for key infrastructure placement, and are based on the recommendations of the specialists. The specialists also confirmed that the project layouts are acceptable.

This BA Process has considered the nature, scale and location of the development as well as the wise use of land. When considering the timing of this project, based on the Proposed Balanced Plan for new generation capacity in the 2025 Integrated Resource Plan (IRP), energy storage (including Eskom BESS allocations) had a current base of 712 MW at the end of 2025 (including Eskom BESS allocations); and approximately 3 724 MW of new energy storage capacity is estimated for the period of 2026 to 2030 (i.e. medium term horizon); and approximately 4 500 MW of new energy storage capacity is estimated for the period of 2031 to 2042 (i.e. transition horizon and long-term period). As discussed in the preceding chapters of this BA Report, it is the Project Applicant's intention to bid this project in the future bidding rounds of the BESIPPPP. The project would contribute in the order of 350 MW / 1200 MWh energy storage capacity to the national grid, which has direct and indirect benefits for national economic growth, especially when noting that wind and solar energy are the lowest cost options for new electricity generation in South Africa, and that the BESS would potentially support future solar energy projects in the region.

The proposed projects will be in line with and will be supportive of the objectives of the Polokwane Local Municipality Integrated Development Plan (IDP) in terms of creating more job opportunities and promoting economic growth. If approved by the DFFE, the proposed projects will provide skills development opportunities, create contractual and permanent employment in the area during the construction and operational phases, and consequently provide catalytic opportunities for downstream economic development.

Section 24 of the Constitutional Act states that "*everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures, that prevents pollution and ecological degradation; promotes conservation; and secures ecologically sustainable development and use of natural resources while promoting justifiable economic and social development*". Based on this, this BA Process was undertaken to ensure that these principles are met through the inclusion of appropriate management and mitigation measures, and monitoring requirements. These measures will be undertaken to promote conservation by avoiding the sensitive environmental features present on site and through appropriate monitoring and management plans (refer to the EMPrs in Appendix H to Appendix K of this BA Report).

The outcomes of these projects therefore succeed in meeting the environmental management objectives of protecting the ecologically sensitive areas and supporting sustainable development and the use of natural resources, whilst promoting justifiable socio-economic development in the towns nearest to the project site. The findings of this BA Process show that all natural resources will be used in a sustainable manner (i.e., the majority of the negative site specific and cumulative environmental impacts are considered to be of low to very low significance with mitigation measures implemented), while the benefits from the projects will promote justifiable economic and social development.

Taking into consideration the findings of this BA Process and given the national and provincial strategic requirements for infrastructure development, particularly from an energy storage perspective, and based on the fact that the environmental sensitivity of the development footprints is largely low to medium (with high sensitivity due to avifauna collision and electrocution risk identified by the Avifauna specialists, and the seep wetland identified by the Aquatic Biodiversity and Terrestrial Biodiversity specialists), it is the opinion of the EAP, that the benefits of the projects outweigh the costs and that the projects will make a positive contribution to sustainable infrastructure development in the Polokwane Local Municipality, as well as the town of Polokwane.

Provided that the specified mitigation measures and management actions are applied effectively throughout, it is <u>recommended that the proposed projects receive EA</u> in terms of the 2014 NEMA EIA Regulations (as amended).

It is understood that the information contained in the BA Report and appendices is sufficient to make a decision in respect of the activities applied for.

In line with the approval of the combination and multiple EA request (as noted in Appendix C.7 of the BA Report), it is proposed that for these projects, separate EAs will be issued (should they be granted), as follows:

- **EA 1 (should it be granted) for the Veroniva BESS (Project 1); and**
- **EA 2 (should it be granted) for the Veroniva EGI (Project 2).**

It is recommended that the EAs (should they be granted) be **valid for a period of 10 years**.

In addition, it is recommended that the EMPrs compiled as part of this BA Process, included in Appendix H to Appendix K of this BA Report, be approved concurrently in the EAs (should they be granted). Detailed **final** layouts of the BESS and EGI were identified during the BA Phase and have been included in Chapter 13 of the BA Report, as well as Appendix D and the EMPrs.