

Lichtenburg 2, North West Province

Motivation for Amendment of the Environmental
Authorisation

DEA Ref.: 14/12/16/3/3/2/1092

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TABLE OF CONTENTS

	PAGE
PROJECT DETAILS	i
TABLE OF CONTENTS	ii
APPENDICES	iv
PURPOSE OF THE REPORT	v
1. OVERVIEW OF THE PROJECT	1
1.1. Location	1
1.2. Potential Environmental Impacts as determined through the EIA Process	1
1.2.1. Summary of environmental findings	3
1.2.2. Impacts on Ecology and Hydrology.....	3
1.2.3. Impacts on Avifauna	3
1.2.4. Impacts on Land Use, Soil and Agricultural Potential.....	4
1.2.5. Impacts on Heritage Resources	4
1.2.6. Visual Impacts	5
1.2.7. Social Impacts	5
2. OVERVIEW OF THE PROPOSED AMENDMENT	7
2.1. A change to the details of the contact person of the EA Holder	7
2.2. An update to the project description of the EA to include the construction and operation of a Battery Energy Storage System (BESS)	7
3. MOTIVATION FOR THE PROPOSED AMENDMENTS	10
3.1. A change to the details of the contact person of the EA Holder	10
3.2. An update to the project description of the EA to include the construction and operation of Battery Energy Storage System (BESS)	10
4. CONSIDERATIONS IN TERMS OF THE REQUIREMENTS OF THE EIA REGULATIONS	11
5. POTENTIAL FOR CHANGE IN THE SIGNIFICANCE OF IMPACTS AS ASSESSED IN THE EIA AS A RESULT OF THE PROPOSED amendment	12
5.1. Assumption and Limitations	12
5.2. The significance of impacts as assessed in the EIA as a result of the proposed amendment	12
5.3. Impacts on Ecology and Hydrology	12
5.3.1. Cumulative Assessment	13
5.3.2. Conclusion	14
5.4. Impacts of Avifauna	16
5.4.1. Cumulative Assessment	17
5.4.2. Conclusion	17
5.5. Impacts on Land Use, Soil and Agricultural Potential	17
5.5.1. Cumulative Assessment	18
5.5.2. Conclusion	18
5.6. Impacts on Heritage Resources	18
5.6.1. Cumulative Assessment	20
5.6.2. Conclusion	20
5.7. Visual Impacts	21
5.7.1. Cumulative Assessment	21
5.7.2. Conclusion	21
5.8. Impacts on the Social Environment	21
5.8.1. Cumulative Assessment	22

5.8.2.	Conclusion	22
6.	RISKS ASSOCIATED WITH THE PROPOSED AMENDMENT	23
7.	ADVANTAGES AND DISADVANTAGES OF THE PROPOSED AMENDMENT	26
8.	REQUIREMENTS FOR ADDITIONAL MITIGATION AS A RESULT OF THE PROPOSED AMENDMENT	27
9.	PUBLIC PARTICIPATION	28
10.	CONCLUSION	29

APPENDICES

Appendix A:	Ecological Specialist Letter
Appendix B:	Avifauna Specialist Letter
Appendix C:	Soils and Agricultural Potential Specialist Letter
Appendix D:	Heritage Specialist Letter
Appendix E:	Visual Specialist Letter
Appendix F:	Social Specialist Letter
<i>Appendix F1:</i>	<i>Social Specialist Letter Peer Review</i>
Appendix G:	Public Participation Documentation
<i>Appendix G1:</i>	<i>I&AP Database</i>
<i>Appendix G2:</i>	<i>Consultation with I&APs</i>
<i>Appendix G3:</i>	<i>Consultation with Organs of State</i>
<i>Appendix G4:</i>	<i>Advertisements and Site Notices</i>
<i>Appendix G5:</i>	<i>Comments Received</i>
<i>Appendix G6:</i>	<i>Comments and Responses Report</i>
<i>Appendix G7:</i>	<i>Public Participation Plan</i>
Appendix H:	Environmental Management Programme
Appendix I:	A3 Maps
Appendix J:	Environmental Team CVs
Appendix K:	EAP Affirmation

PURPOSE OF THE REPORT

Environmental Authorisation (EA) for the Lichtenburg 2 solar energy facility in the North West Province (DEA Ref: 14/12/16/3/3/2/1092) was obtained by ABO Wind Lichtenburg 2 PV (Pty) Ltd. The project was authorised by the Department of Environment, Forestry and Fisheries (DEFF)¹ for the development of a solar energy facility with a contracted capacity of up to 100MW and associated infrastructure on Portion 23 of the Farm Houthaalboomen No. 31 and the Remaining Extent of Portion 2 of the Farm Zamenkomst No. 4 in the North West Province.

Due to the demand in the utilisation of battery energy storage systems for renewable energy projects, as well as to ensure an adequate supply of electricity to the national grid, ABO Wind Lichtenburg 2 PV (Pty) Ltd is proposing the construction and operation of a Battery Energy Storage (BESS) with a capacity of up to 500MW/500MWh within the authorised development footprint of the solar energy facility. The BESS will be developed within the authorised laydown area of the solar energy facility and with an extent of no more than 5ha. It is understood that the BESS may require the storage of dangerous goods for the operation and maintenance of the system, however, this will be limited².

The development of the BESS is based on the intention to bid the project as part of the Risk Mitigation Independent Power Producer (IPP) Procurement Programme and/or Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) of the Department of Mineral Resources and Energy (DMRE) and/or any future relevant procurement programme. Ultimately, the development of the solar PV facility as well as the battery energy storage system is intended to be part of the renewable energy projects portfolio for South Africa, as contemplated in the Integrated Resources Plan (IRP). For solar energy to be dispatchable it will require the additional battery energy storage applied for in this amendment.

In terms of Condition 5 of the Environmental Authorisation and Chapter 5 of the EIA Regulations of December 2014 (as amended on 07 April 2017 and 13 July 2018), it is possible for an applicant to apply, in writing, to the competent authority for a change or deviation from the project description to be approved. The proposed amendment for the construction and operation of the BESS does not trigger any new listed activities. The BESS will be located within the originally authorised footprint of the solar energy facility as assessed during the EIA process.

Savannah Environmental has prepared this Motivation Report in support of the application for the proposed amendment on behalf of ABO Wind Lichtenburg 2 PV (Pty) Ltd. This report aims to provide detail pertaining to the environmental impacts as a result of the proposed amendment in order for interested and affected parties to be informed and submit comments for the competent authority to be able to reach a decision in this regard. This report is supported by specialist input letters to inform the conclusion and recommendations regarding the proposed amendment (refer to **Appendix A to F** of this report). This Motivation Report must be read together with these specialist input letters in order to obtain a complete understanding of the proposed amendment and the implications thereof from an environmental perspective.

¹ Then known as the Department of Environmental Affairs (DEA).

² Based on the limited storage required for the BESS, no new listed activities will be triggered.

This Motivation Report has been made available for a 30-day review and comment period in accordance with Regulation 32(1)(aa) of the EIA Regulations, 2014 (as amended) from **Friday, 16 October 2020 to Monday, 16 November 2020**. The availability of the Motivation Report for the 30-day comment and review period was advertised in the Noordwester Newspaper on **Friday, 16 October 2020** (refer to **Appendix H4** of the Motivation Report).

The Motivation Report is available for download from Savannah Environmental's website: <https://www.savannahsa.com/public-documents/energy-generation/>. To register on the project database as an interested and affected party, as well as obtain further information about the project, or submit written comments, please contact:

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All comments received during the 30-day review and comment period will be included within a Comments and Responses Report (C&RR) to be submitted to the DEFF with the Final Motivation Report for consideration and decision-making.

1. OVERVIEW OF THE PROJECT

1.1. Location

The authorised Lichtenburg 2 solar energy facility is located 10km north of Lichtenburg and 7.5km south of Bakerville in the North West Province (refer to **Figure 1.1**). The project is located within Ward 16 of the Ditsobotla Local Municipality and the Ngaka Modiri Molema District Municipality in the North West Province. The development footprint of the solar energy facility is located on Portion 23 of the Farm Houthaalboomen No. 31 and the Remaining Extent of Portion 2 of the Farm Zamenkomst No. 4. It is within these properties that Lichtenburg 2 will be constructed and operated.

The following infrastructure was authorised for the project by DEFF, as fully assessed within the Environmental Impact Assessment (EIA) process:

- » Photovoltaic modules with a net generation (contracted) capacity of 100MW;
- » On-site 88/132kV substation;
- » Mounting structures (fixed tilt/static, single axis or double axis tracking systems) for the PV arrays and related foundations;
- » DC/AC Inverters, LV/MV power transformers and internal electrical reticulation (underground cabling);
- » A new 88/132kV overhead power line from the on-site substation to the Mmabatho / Watershed DS 1 88kV Power Line;
- » Access and internal road network;
- » Temporary laydown area;
- » Auxiliary buildings (gate-house and security, control centre, office, two warehouses, canteen and visitors centre, rainwater tanks, etc); and
- » Perimeter fencing.

1.2. Potential Environmental Impacts as determined through the EIA Process

From the specialist investigations undertaken within the EIA process for Lichtenburg 2 (Savannah Environmental, 2019), the following environmental impacts relevant to the amendment application were identified:

- » Impacts on Ecology and Hydrology
- » Impacts on Avifauna
- » Impacts on Land Use, Soil and Agricultural Potential
- » Impacts on Heritage Resources
- » Visual Impacts
- » Social Impacts
- » Traffic Impacts

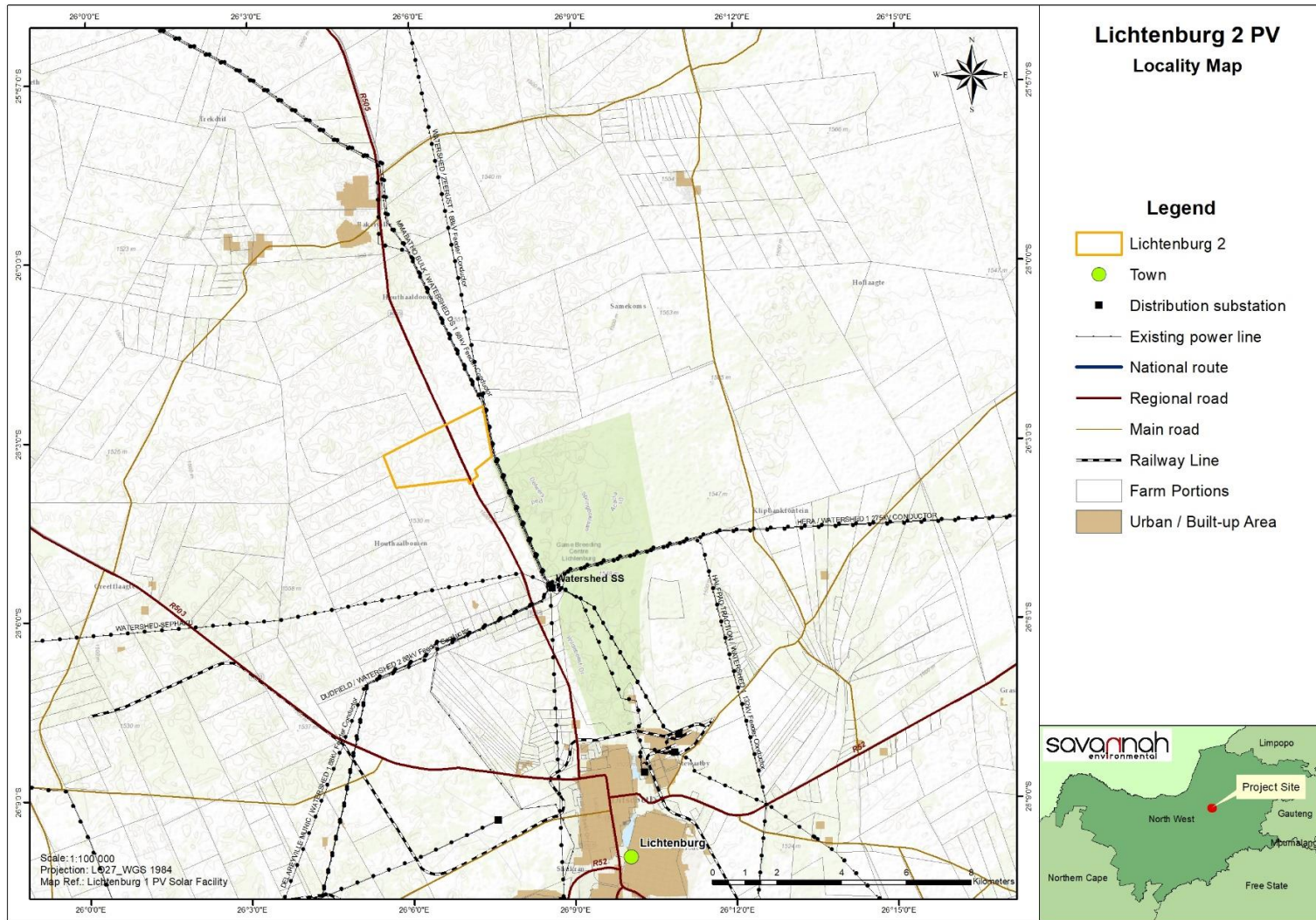


Figure 1.1: A map showing the location of the affected properties associated with Lichtenburg 2. A3 maps have been included in **Appendix I** of the Motivation Report.

Key conclusions and recommendations of the original EIA pertinent to this application, as reported in the Final EIA Report (Savannah Environmental, 2019):

1.2.1. Summary of environmental findings

The EIA found that based on the nature and extent of the project, the level of disturbance predicted as a result of the construction and operation of the solar energy facility and the associated infrastructure was assessed as low to medium and that the impacts associated with the proposed development could be managed and mitigated to an acceptable level. No fatal flaws were identified to be associated with Lichtenburg 2.

1.2.2. Impacts on Ecology and Hydrology

The Ecological and Hydrological Impact Assessment assessed the impact of Lichtenburg 2 on the sensitive ecological and hydrological features present within the project site for the life-cycle of the project. The assessment identified impacts within the construction and operation phases of the project.

During the construction phase, the impacts expected to occur include impacts on vegetation and listed and protected plant species, faunal impacts, an increased erosion risk and increased alien plant invasion. The significance of the construction phase impacts ranges from medium to low, following the implementation of the recommended mitigation measures by the specialist. No impacts of a high significance were identified prior to the implementation of mitigation.

During the operation phase, the anticipated impacts include altered runoff patterns due to rainfall interception by the PV panel infrastructure and compacted areas resulting in high levels of erosion, increased alien plant invasion, an increased erosion risk and faunal impacts. The significance of the impacts for the operation phase ranges from medium to low, following the implementation of the recommended mitigation measures by the specialist. No impacts of a high significance were identified for the project.

From the findings of the Ecological and Hydrological Impact Assessment it was concluded that no impacts of high ecological or hydrological significance were identified which would hinder the development of Lichtenburg 2 and its associated infrastructure within the project site. The proposed development is considered to be appropriate and acceptable from an ecological and surface hydrological perspective and will not result in detrimental impacts to ecosystems and habitat features present within the project site and within the surrounding properties. The specialist has therefore indicated that the development may be authorised, constructed and operated, subject to the implementation of the recommended mitigation measures.

1.2.3. Impacts on Avifauna

The Avifauna Impact Assessment was based on the findings of a point count sampling technique applied during two site visits undertaken for the EIA process in June 2018 and October 2018 (i.e. wet and dry season site visits). The avifauna impacts identified to be associated with Lichtenburg 2 will be negative and local to regional in extent. The duration of the impacts will be medium to long-term, for the lifetime of the PV facility.

During the construction phase of Lichtenburg 2 a loss of habitat due to clearance of vegetation is expected to occur. The significance of this impact can be reduced to low with the implementation of the recommended mitigation measures provided by the specialist.

The majority of the avifauna impacts associated with the development of Lichtenburg 2 will occur during the operation phase. These impacts include the creation of “new” avian habitat which refers to the creation of novel habitat for commensal or superior competitive bird species, the electrocution of birds due to the associated power line, and collision with the PV panels and the power line. The significance of the impacts will be low to medium, with the exception of a high significance for the impact of avian collision with the power line.

From the results of the avifauna assessment, it can be concluded that no fatal flaws will be associated with the development of Lichtenburg 2 from an avifaunal perspective.

1.2.4. Impacts on Land Use, Soil and Agricultural Potential

The proposed Lichtenburg 2 project infrastructure is located on shallow, rocky soils with low to moderate-low land capability. The construction and operation of a PV facility on the project site is considered acceptable from a soils perspective as it will supplement and stabilise the landowner's income in an area where farming is susceptible to periodic droughts. Centre pivot irrigation areas, where good crop yields are obtained, have been avoided by the development infrastructure associated with Lichtenburg 2.

Impacts have been identified for both the construction and operation phases for Lichtenburg 2. The impacts associated with land use, soil and agricultural potential include an increased risk of soil erosion, potential chemical pollution, and loss of land capability. The significance of the impacts ranges from low to medium with the implementation of the mitigation measures recommended by the specialist.

1.2.5. Impacts on Heritage Resources

The project site has been disturbed and transformed by agricultural activities which has led to the presence of pre-existing agricultural plough fields, grazing areas and farm buildings. Furthermore, throughout the agricultural areas within the project site, several heaps of rocks which have been removed from the agricultural fields were identified. No archaeological resources, graves or burial grounds were identified within the project site. In addition, no structures of heritage importance were recorded.

Considering the palaeontology of the project site, it was identified that the area in question is located within the Malmani Group which contains a number of stromatolitic dolomites. The geological structures of the project site suggest that the rocks are much too old to contain fossils other than blue-green algae. Taking account of the defined criteria, the potential impact to fossil heritage resources is negligible to extremely low.

The Heritage Impact Assessment identified impacts associated with the construction and operation of Lichtenburg 2. The assessment of impacts on heritage resources include an assessment of the archaeology and palaeontology of the project site.

Impacts on palaeontological and archaeological resources are expected to occur during the construction phase of Lichtenburg 2. The impacts relate to the excavations required for the construction of the facility

and will occur only in the event that an archaeological or palaeontological resource is present. The significance of the impact will be low and no mitigation has been recommended by the specialist due to the lack of heritage resources within the area. The requirement for the development and implementation of a chance find procedure in the event of a heritage find has been included.

1.2.6. Visual Impacts

The Visual Impact Assessment identified negative impacts on visual receptors during the undertaking of construction activities and the operation phase of Lichtenburg 2.

During the construction phase the undertaking of construction activities will impact on sensitive visual receptors in close proximity to Lichtenburg 2. The construction phase will result in a noticeable increase in heavy vehicles utilising the roads which may cause a visual nuisance to other road users and landowners in the area. The construction phase visual impacts will have a low significance following the implementation of the recommended mitigation measures.

Visual impacts expected to occur during the operation phase include impact on sensitive visual receptors in close proximity (i.e. within 3km) of the facility, visual impact on sensitive visual receptors within the broader region (i.e. within 3-6km), lighting impacts, solar glint and glare impacts, visual impact of the ancillary infrastructure, the visual impact on sensitive visual receptors located within a 500m radius of the associated power line infrastructure and a visual impact of Lichtenburg 2 on the sense of place in the region. The significance of the visual impacts ranges from low to moderate with the implementation of the recommended mitigation measures. Visual impacts on sensitive visual receptors in close proximity to the PV facility are not considered to be a fatal flaw for the development. No mitigation is possible for the visual impact on sensitive visual receptors within 500m of the power line infrastructure, therefore only best practise measures can be implemented and have been recommended by the specialist.

1.2.7. Social Impacts

The specialist study identified vulnerable communities within the broader area that may be affected by the development of Lichtenburg 2 and its associated infrastructure. Traditionally, the construction phase of a PV solar development is associated with the majority of social impacts. Many of the social impacts are unavoidable and will take place to some extent, but can be managed through the careful planning and implementation of appropriate mitigation measures. A number of potential positive and negative social impacts have been identified for the project, however an assessment of the potential social impacts indicated that there are no perceived negative impacts that are sufficiently significant to allow them to be classified as fatal flaws.

The Social Impact Assessment identified positive and negative impacts which are expected to occur during the construction and operation phases of Lichtenburg 2. The assessment identified that the expected benefits associated with the project, which include generation of electricity from renewable sources and local economic and social development, outweigh the perceived impacts associated with the project.

During the construction phase the positive impacts expected to occur include direct and indirect employment opportunities and skills development and economic multiplier effects. The significance of these impacts is medium with the implementation of the recommended enhancement measures. The negative social impacts expected to occur during the construction phase include an influx of jobseekers and change

in population, safety and security impacts, impacts on daily living and moving patterns, nuisance impacts (i.e. noise and dust) and visual impacts. The significance of the negative construction phase impacts will be low to medium with the implementation of the recommended mitigation measures

During the operation phase the positive impacts expected to occur include direct and indirect employment opportunities and skills development, development of non-polluting, renewable energy infrastructure and a contribution to Local Economic Development (LED) and social upliftment. The significance of the positive operation impacts will be medium to high with the implementation of the recommended enhancement measures. The negative impacts expected during the operation phase include a visual and sense of place impact and impacts associated with the loss of agricultural land. The significance of the negative operation impacts will be low to medium with the implementation of the recommended mitigation measures.

1.2.8. Traffic Impacts

The Traffic Impact Assessment considered the impacts that the development of Lichtenburg 2 will have on the road network within the surrounding area.

During the construction phase imported elements associated with the development of Lichtenburg 2 will be shipped to and transported from the nearest and most practical port. It is estimated that the total number of heavy vehicle trips would vary between 4500 and 6000 during the construction phase. The calculated number of daily trips would be between 15 and 25. The impact of this on the road network would be negligible, as the additional peak hourly traffic would at most be 2 trips. The low construction and post construction traffic would have no significant impact on the existing traffic levels.

During the operation phase the total number of trips to be generated by the permanent workforce during the AM and PM peak period is 18 vehicles per hour. No other trips are expected to be generated during the operation phase and therefore the additional traffic is not considered to have a significant effect on the internal roads or the access roads and surrounding areas. The significance of the traffic impacts during the operation phase will be low with the implementation of the recommended mitigation measures.

2. OVERVIEW OF THE PROPOSED AMENDMENT

The amendment being applied for relate to the project description as well as a change in the postal address and contact details of the EA Holder, as detailed in the EA dated 02 July 2019. The requested amendment will result in the construction and operation of a BESS with a capacity of up to 500MW/500MWh within the authorised development footprint of Lichtenburg 2.

This section of the Motivation Report details the amendment considered within this report and by the specialist investigations (refer to **Appendix A – F**). Each amendment request is detailed below.

2.1. A change to the details of the contact person of the EA Holder

The details of the postal address and contact details of the EA Holder have changed. Therefore, the applicant is lodging a request to amend the details to ensure that the EA lists the contact details and postal address of the EA Holder correctly.

EA Page Reference	Current Authorised Details	Proposed wording
Page 1 (cover page) and Page 2 (Activities Authorised)	PO Box 51060 WATERFRONT Cape Town 8002 Tel: 021 418 2596 Cell: (060) 030 3633 Email: Robert.wagener@abo-wind.com	Unit B1 Mayfair Square, Century Way, Century City 7441 Tel: 021 276 3620 Cell: 073 265 8575 Email: Capetown@abo-wind.com

2.2. An update to the project description of the EA to include the construction and operation of a Battery Energy Storage System (BESS)

The applicant is requesting an update to the project description of the EA to include the construction and operation of a Battery Energy Storage System (BESS) with a capacity of up to 500MW/500Wh within the authorised development footprint of the solar energy facility (refer to **Figure 2.1**). The BESS will be developed within the authorised development footprint of Lichtenburg 2, within the authorised laydown area and with an extent of no more than 5ha. It is understood that the BESS may require the storage of dangerous goods for the operation and maintenance of the systems, however this will be limited³. The BESS will connect to the authorised on-site facility substation of Lichtenburg 2 via multi-core 33kV underground cables (to follow the internal access roads of the authorised PV facility).

EA Page Reference	Proposed wording
Page 5, The Lichtenburg 2 PV SEF will comprise the following:	Battery Energy Storage System (BESS)
Page 6, Technical Details of the Solar Energy Facility	» Electrochemical battery energy storage systems (including either Lead Acid and Advanced Lead Acid, NiCd, NiMh-based batteries; Temperature (NaS, Na-NiCl₂, Mg/Pb-Sb) batteries or Flow batteries (VRFB, Zn-Fe, Zn-Br)) with a maximum height of 3.5m; and
Battery Energy Storage System (BESS)	

³ No new listed activity will be triggered.

EA Page Reference	Proposed wording
	» Multi-core, 33kV underground cables, to follow internal access roads of the PV facility, to connect the battery storage system to the on-site facility substation.

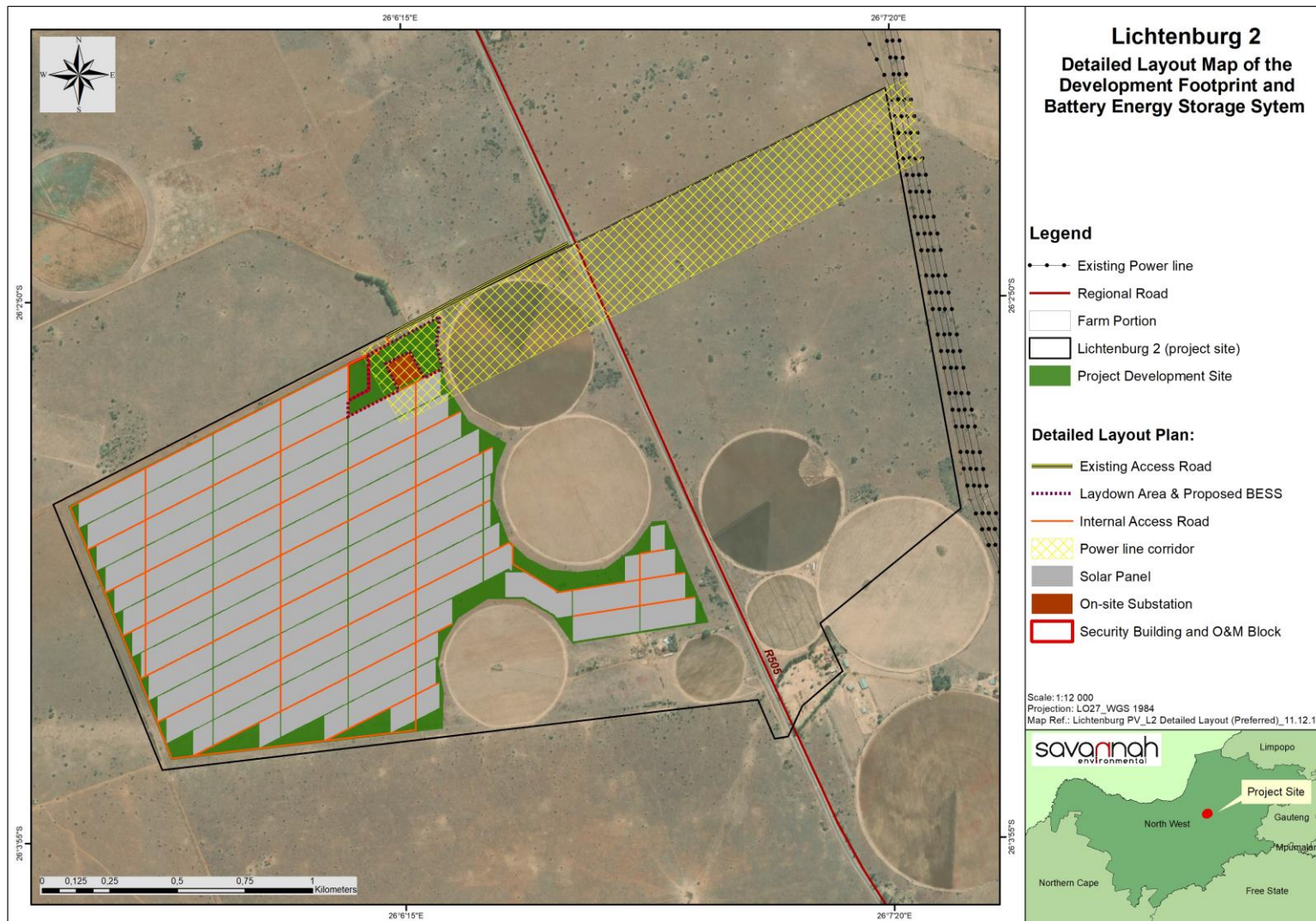


Figure 2.1: A map showing the layout of the BESS within the authorised development footprint of the solar energy facility. A3 maps have been included in **Appendix I** of the Motivation Report.

3. MOTIVATION FOR THE PROPOSED AMENDMENTS

The sections below describe the motivation for each of the requested amendment.

3.1. A change to the details of the contact person of the EA Holder

The details of the postal address and contact details of the EA Holder have changed. Therefore, the applicant is lodging a request to amend the details to ensure that the EA lists the contact details and postal address of the EA Holder correctly.

3.2. An update to the project description of the EA to include the construction and operation of Battery Energy Storage System (BESS)

The applicant is requesting an update to the project description of the EA to include the construction and operation of a BESS with a capacity of up to 500MW/500MWh within the authorised development footprint of the solar energy facility. The BESS will be developed within the authorised laydown area, and with an extent of no more than 5ha. It is understood that the BESS may require the storage of dangerous goods for the operation and maintenance of the system, however this will be limited.

The general purpose and utilisation of the BESS will be to save and store excess electrical output from the solar energy facility as it is generated, allowing for a timed release to the national grid when the capacity is required. In addition, the BESS will also provide grid strengthening and quality improvement, frequency control and voltage stabilisation. The BESS will therefore provide flexibility in the efficient operation of the electricity grid through decoupling of the energy supply and demand. Furthermore, the development of the BESS for the project is of importance as the system will ensure that electricity is fed into the national grid when required and excess amounts stored. This will allow for extended hours of generation from the 100MW solar energy facility.

4. CONSIDERATIONS IN TERMS OF THE REQUIREMENTS OF THE EIA REGULATIONS

In terms of Regulation 31 of the EIA Regulations 2014, as amended, an environmental authorisation may be amended by following the process in this Part (i.e. a Part 2 amendment) if it is expected that the amendment may result in an increased level or change in the nature of impact where such level or change in nature of impact was not:

- a) Assessed and included in the initial application for environmental authorisation; or
- b) Taken into consideration in the initial authorisation.

The amendment to develop a BESS with a capacity of up to 500MW/500MWh was not specified or considered in the initial environmental authorisation. The requested amendments do not on their own constitute listed or specified activities. Therefore, the application is made in terms in terms of Regulation 31(b) of the EIA Regulations, 2014.

5. POTENTIAL FOR CHANGE IN THE SIGNIFICANCE OF IMPACTS AS ASSESSED IN THE EIA AS A RESULT OF THE PROPOSED AMENDMENT

5.1. Assumption and Limitations

It is assumed that all the information provided by the Applicant, Organs of State and Key Stakeholders is accurate and valid for the project. The authorised development footprint of Lichtenburg 2 was assessed in its entirety during the undertaking of the EIA and therefore there are no uncertainties with regards to the assessment of the proposed amendment for the construction and operation of the BESS within the authorised development footprint of the solar energy facility.

5.2. The significance of impacts as assessed in the EIA as a result of the proposed amendment

In terms of Regulation 32(1)(a)(i), the following section provides an assessment of the impacts related to the proposed amendment. Understanding the nature of the proposed amendment to include the BESS within the project description and the impacts associated with the project (as assessed within the EIA), the following has been considered:

- » Impacts on Ecology and Hydrology
- » Impacts on Avifauna
- » Impacts on Land Use, Soil and Agricultural Potential Impacts
- » Heritage Impacts (including palaeontology)
- » Visual Impacts
- » Impacts on the Social Environment

The potential for change in the significance and/or nature of impacts based on the proposed amendment as described within this Motivation Report is discussed below and detailed in the specialists' assessment addendum letters included in **Appendix A – F**⁴⁵. Additional mitigation measures recommended as a result of the proposed amendment have been underlined for ease of reference, where applicable. This section of the Motivation Report must be read together with the specialist addendum letters contained in **Appendix A - F** in order for the reader to obtain a complete understanding of the proposed amendment and the implications thereof.

5.3. Impacts on Ecology and Hydrology

The Ecology and Surface Hydrology Specialist Addendum Letter (**Appendix A**) included a review and assessment of the original Ecological and Surface Hydrological Impact Assessment (Botha, 2018) and data, as well as the update of any previously assessed impacts and additional mitigation measures, where required. The Ecological and Surface Hydrological Impact Assessment (Botha, 2018) identified that the

⁴ It must be noted that the original specialists who undertook the EIA studies have been used for these assessments as far as possible.

⁵ Impacts from a traffic perspective have not been considered as no change in impact will occur and therefore the results and recommendations of the Traffic Impact Assessment undertaken within the EIA Report is considered to be relevant to the proposed amendment.

development of the solar energy facility is located within the *Elionurus muticus* – *Helichrysum callicamum* Savanna Grassland habitat and the *Hyparrhenia hirta* – *Elionurus muticus* Palaeo-drainage Grassland. Following the field work undertaken by the specialist during the EIA process, no wetlands or watercourses were identified within the development footprint of the solar energy facility, including the proposed location of the BESS.

According to the sensitivity classification of the project site, the entire extent of the development footprint is located within an area associated with a medium and low sensitivity (refer to **Figure 5.1**). There are no areas and features of a high sensitivity within the development footprint of the solar energy facility as well as the location of the BESS from an ecological and surface hydrology perspective. Therefore, the development of the solar energy facility, including the BESS, within this habitat is considered to be acceptable.

Three (3) floral species were identified within the project site, none of which are Red Data species. These species are all listed as protected species within the relevant provincial conservation ordination (*Boophone disticha*, *Ammocharis coranica* and *Vachelia erioloba*). Furthermore, *V. erioloba* is also a protected tree under the National Forest Act. The majority of the project site (all natural to near-natural areas) is located within a Terrestrial ESA1 (corridor area) whilst the transformed areas are classified as Terrestrial ESA2 (corridor areas). The impact assessment found that with careful planning and the necessary mitigation measures in place, the proposed development will not result in a severe alteration of the functionality of the larger area as a corridor of movement (ESA), and is therefore considered acceptable within the identified areas. This will also be relevant to the development of the BESS within the authorised laydown area. The project site falls within an Aquatic ESA2 due to its location within the North West Dolomite Karst Belt which is associated with extensive groundwater resources. It was however determined that it is unlikely that the development will have a significant impact on such resources. Therefore, with the necessary mitigation measures in place, it is unlikely that the development, with the inclusion of a BESS, will impact the larger area's capability as a functional corridor for the movement of fauna and flora (ESA1 and ESA2).

The construction and operation of the BESS within the development footprint of Lichtenburg 2 will not have an impact on any additional areas of ecological and surface hydrology importance (refer to **Figure 5.1**). As such, the medium and low sensitivity rating of the Ecological and Surface Hydrological Assessment (Botha, 2018) following the implementation of the recommended mitigation measures would remain relevant for the proposed amendment. As a result, no additional impacts are identified or mitigation measures recommended as the impacts and mitigation measures included in the Ecological and Surface Hydrological Assessment (Botha, 2018) are deemed as relevant and adequate for the proposed amendment.

5.3.1. Cumulative Assessment

Cumulative impacts assessed as a result of Lichtenburg 2 as well as other renewable energy facilities within the region include a reduced ability to meet conservation obligations and targets, impacts on ecological support areas and broad-scale ecological processes. Cumulative impacts have been sufficiently addressed within the Ecological and Surface Hydrological Impact Assessment (Botha, 2018). The proposed amendment would not contribute to the significance of the cumulative impacts identified and assessed in the Ecological and Surface Hydrological Assessment (Botha, 2018).

In conclusion, no additional mitigation measures in addition to those included in the Ecological and Surface Hydrological Impact Assessment (Botha, 2018) are recommended from a cumulative perspective.

5.3.2. Conclusion

The specialist concluded that the construction and operation of the BESS would not result in any additional ecological and surface hydrology impacts and that the infrastructure was acceptable. The findings of the cumulative assessment indicate that the development of the solar energy facility (including the BESS) as well as other renewable energy facilities in the region will have minimal impact on the ecological support areas and broad-scale ecological processes.

In general, the impacts identified and assessed within the Ecological and Surface Hydrological Impact Assessment (Botha, 2018) remain unchanged and applicable. In addition, the proposed amendment within the authorised development footprint hold no advantage or disadvantage to ecological functioning and services provided by the affected habitat. Therefore, the implementation of the proposed amendment for Lichtenburg 2 will result in similar ecological and surface hydrological impacts to those presented in the EIA, and no fatal flaws have been identified that could hinder the authorisation of the proposed amendment. As a result, the specialist indicated that the proposed amendment is acceptable and may be authorised subject to the implementation of the recommended mitigation measures included in the Ecological and Surface Hydrological Impact Assessment (Botha, 2018) and the Environmental Management Programme (EMPr).

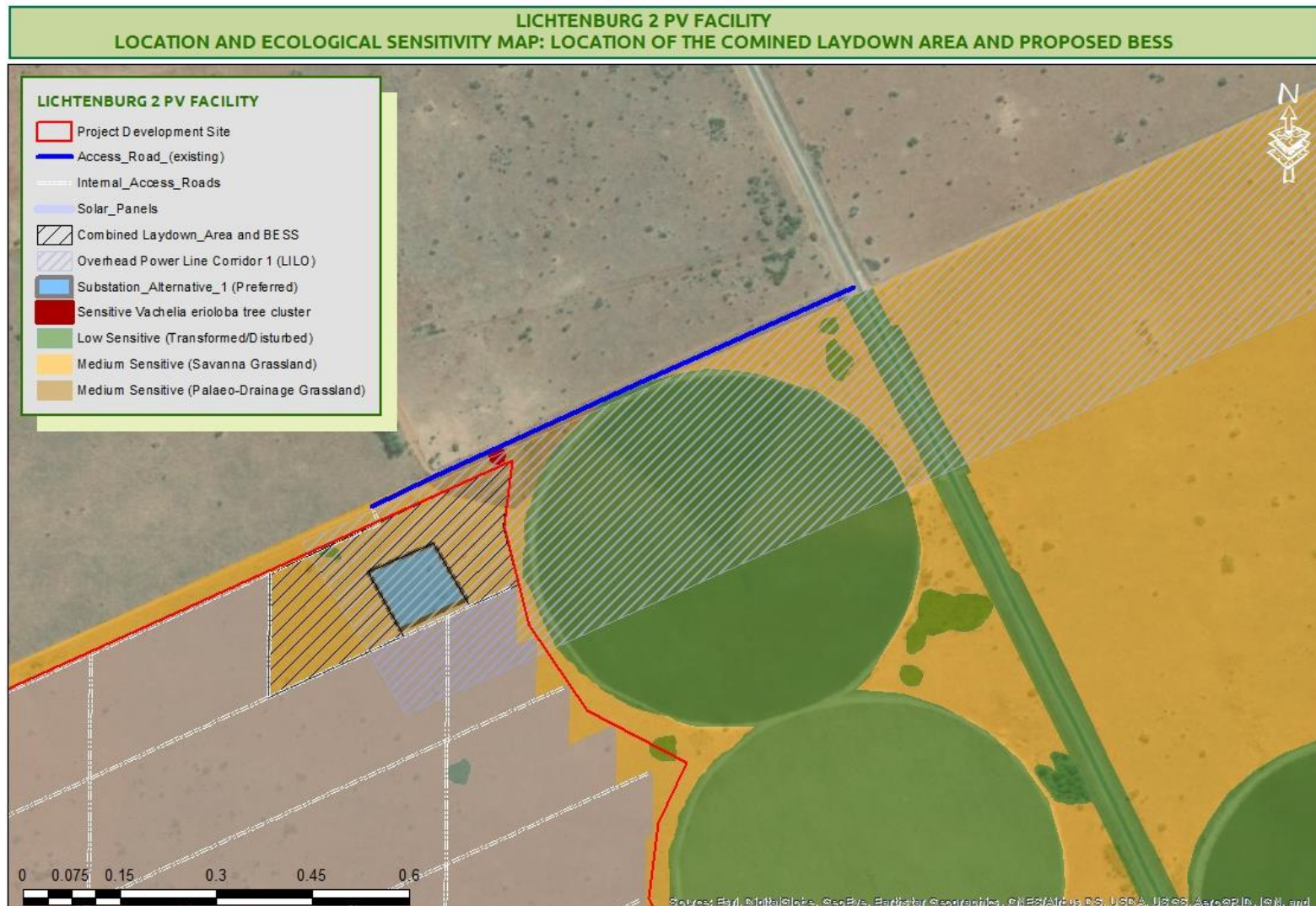


Figure 5.1: The ecological sensitivities within the authorised development footprint of Lichtenburg 2 and the development footprint of the BESS.

5.4. Impacts of Avifauna

The Avifauna Specialist Addendum Letter (**Appendix B**) included a review and assessment of the original Avifauna Impact Assessment (Niemand, 2018) and data, as well as the update of any previously assessed impacts and updated mitigation measures, where required.

The findings of the Avifauna Impact Assessment (Niemand, 2018) indicate that the authorised BESS is located within a medium avifauna sensitivity habitat (refer to **Figure 5.2**). The habitat represents dolomite grassland and bush clump mosaics, which provide suitable foraging habitat for large terrestrial bird species such as the Northern Black Korhaan. The Northern Black Korhaan species are susceptible to collisions with PV panel infrastructure as well as overhead power lines, however the findings of the Avifauna Impact Assessment (Niemand, 2018) indicate that the reporting rates for threatened and near threatened bird species within the authorised footprint of the solar energy facility was relatively low. The low reporting rates of threatened and near threatened bird species within the authorised development footprint of the solar energy facility therefore suggest a medium sensitivity for the authorised development footprint, including the location of the proposed BESS. In addition, the dolomite grassland and bush clump mosaics are widespread in the region and the proposed surface area of the BESS is small when compared to the surface area of natural grassland in the study area, thereby implying that the displacement of birds as a result of the development of the BESS is not regarded as significant nor is the affected habitat unit considered to be a no-go area/area of high sensitivity.

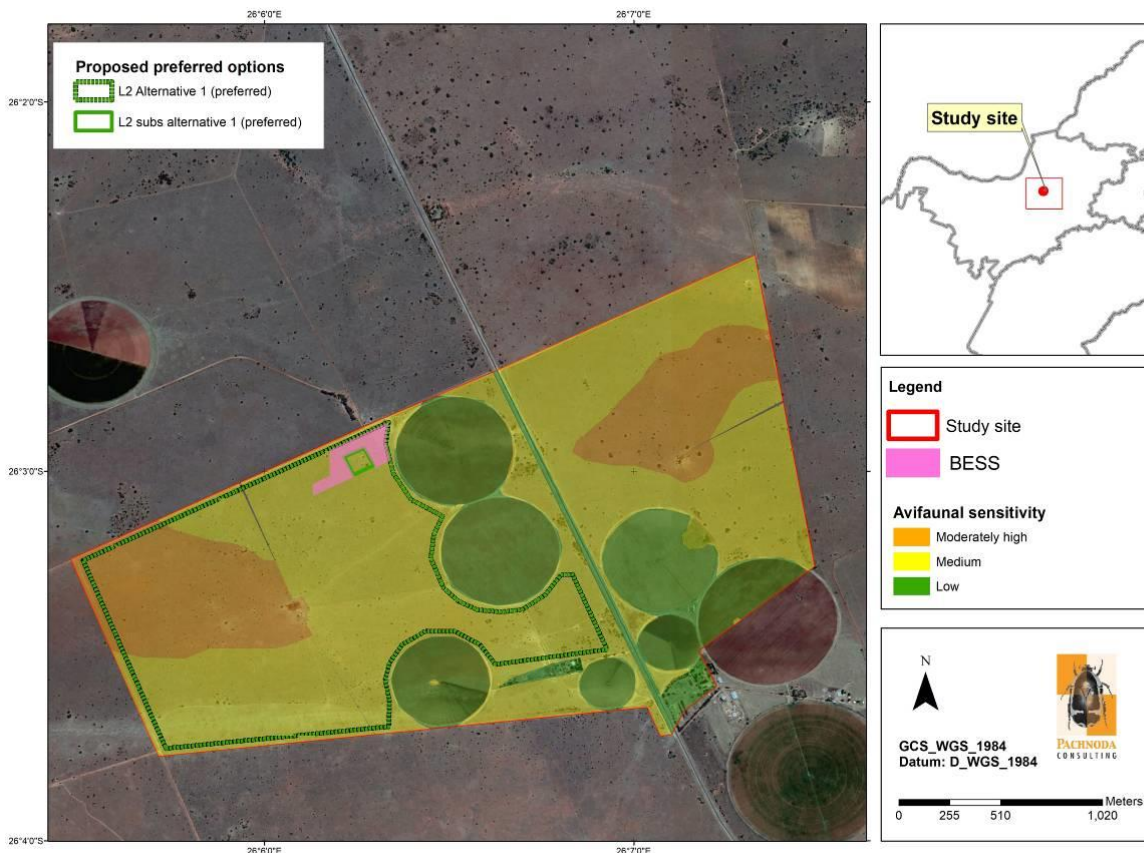


Figure 5.2: A map showing the avifauna sensitivity of Lichtenburg 2. The BESS development footprint is located within an area of medium sensitivity.

The Avifauna Impact Assessment (Niemand, 2018) identified low and medium impacts following the implementation of the recommended mitigation measures, depending on the impact being assessed. Therefore, as the authorised development footprint of the solar energy facility is not located near any prominent watercourses, the risk of the collisions of water birds with the infrastructure of the solar energy facility was considered to be low. As a result, the specialist indicated that the construction and operation of the BESS within the authorised development footprint of the solar energy facility would not have an influence on the outcomes of the original Avifauna Impact Assessment (Niemand, 2018), due to the absence of any features of any features of a high environmental sensitivity, the small extent of the development footprint of the BESS and the fact that the infrastructure will be located within the authorised development footprint which would result in a low net loss of habitat.

5.4.1. Cumulative Assessment

No additional cumulative avifauna impacts were identified by the specialist as a result of the proposed amendment. Therefore, the cumulative impacts identified by the Avifauna Impact Assessment (Niemand, 2018) remain unchanged and would be applicable to the proposed amendment within the authorised development footprint of the solar energy facility.

5.4.2. Conclusion

Therefore, no fatal flaws are identified from an avifauna perspective and the proposed amendment could be authorised subject to the implementation of the recommended mitigation measures included in the Avifauna Impact Assessment (Niemand, 2018). However, the specialist has recommended the following mitigation measures to be included in the Environmental Management Programme (EMPr) (included as **Appendix H** of the Motivation Report) of the project in the view of the occurrence of vultures on pylon structures adjacent to the development footprint of Lichtenburg 2:

- (a) The electrochemical battery energy storage system should be contained or covered (to prevent access to the batteries); and
- (b) Any above-ground cables connecting to the BESS with the on-site facility substation should be covered with insulating material to prevent the risk of potential electrocutions should any large bird species interact in any manner with the BESS.

5.5. Impacts on Land Use, Soil and Agricultural Potential

The Soil and Agricultural Potential Impact Assessment undertaken by Pienaar (2018) described the soil and agricultural properties of the project site and indicated that the area generally consists of the Vaalbos and Nkonkoni soil forms, which are associated with shallow red apedal soils that are overlain by a shallow orthic topsoil which overlies the lithic material or rock. Other soil forms present within the project site include Glenrosa or Mispah.

The land capability of the project site is low to moderate-high. The Lichtenburg 2 development footprint was altered during the EIA process to avoid areas with moderate-high land capability (which includes the location of the BESS). Prior to the environmental authorisation of Lichtenburg 2, the property was used for irrigated grain production and cattle grazing at a grazing density of 10 to 12 ha per Large Stock Unit (ha/LSU).

The findings of the Land Use, Soils and Agricultural Potential Specialist Addendum Letter (**Appendix C**) indicates that no additional impacts are applicable as a result of the proposed amendment within the authorised development footprint of the solar energy facility which include, the construction and operation of the BESS (**Appendix C**).

5.5.1. Cumulative Assessment

From a cumulative perspective, the cumulative impact regarding a decrease in the available areas for livestock grazing as assessed in the EIA remains applicable for the proposed amendment. Therefore, no additional cumulative impacts have been considered from a land use, soils, and agricultural potential perspective as a result of the proposed amendment.

5.5.2. Conclusion

The specialist concluded that the impacts and recommended mitigation measures included in the Land Use, Soils and Agricultural Potential Impact Assessment (Pienaar, 2018) remain unchanged and applicable for the proposed amendment as the construction and operation of the BESS will occur within the authorised development footprint of Lichtenburg 2. As a result, no additional areas will be cleared because of the proposed amendment which could lead to additional impacts from a soils and agricultural potential perspective. Therefore, the specialist is of the opinion that the proposed amendment be authorised subject to the implementation of the recommended mitigation measures included in the Land Use, Soils and Agricultural Potential Impact Assessment (Pienaar, 2018) and the EMPr.

5.6. Impacts on Heritage Resources

The findings of the Heritage Impact Assessment (HIA) (Lavin, 2018) undertaken as part of the EIA process for Lichtenburg 2 indicate that no significant heritage sites were present within the authorised development footprint of the solar energy facility (refer to **Figure 5.3**). Therefore it is unlikely that the proposed amendment to construct and operate a BESS is unlikely to have an impact on heritage resources within the area, as the infrastructure will be placed within an area that already has been authorised (refer to **Appendix D**). Therefore, no new areas will be impacted for the development of the BESS.

The authorised development footprint of Lichtenburg 2 is located within an area associated with a very high palaeosensitivity (refer to **Figure 5.4**), as the development footprint is located within the Malmani Subgroup (refer to **Figure 5.5**) which is associated with stromatolitic dolomites. The stromatolites are considered to be 2.7Ga - 2.7Ga trace fossils and very abundant. However, based on the nature of the proposed project, which includes the development of the solar energy facility as well as the BESS, surface activities may have an impact on the fossil heritage if preserved within the development footprint of the solar energy facility. Considering the age of the stromatolites, they are unlikely to contain fossils other than blue-green algae. It is therefore on this premise that the impact of the proposed development as well as the proposed amendment will be negligible. Therefore, the implementation of the proposed amendment within the authorised development footprint of Lichtenburg 2 is unlikely to result in significant impacts on palaeontological resources.

In general, the heritage (including palaeontology) impacts identified and assessed as part of the EIA process remain unchanged and are considered to be of a low significance.

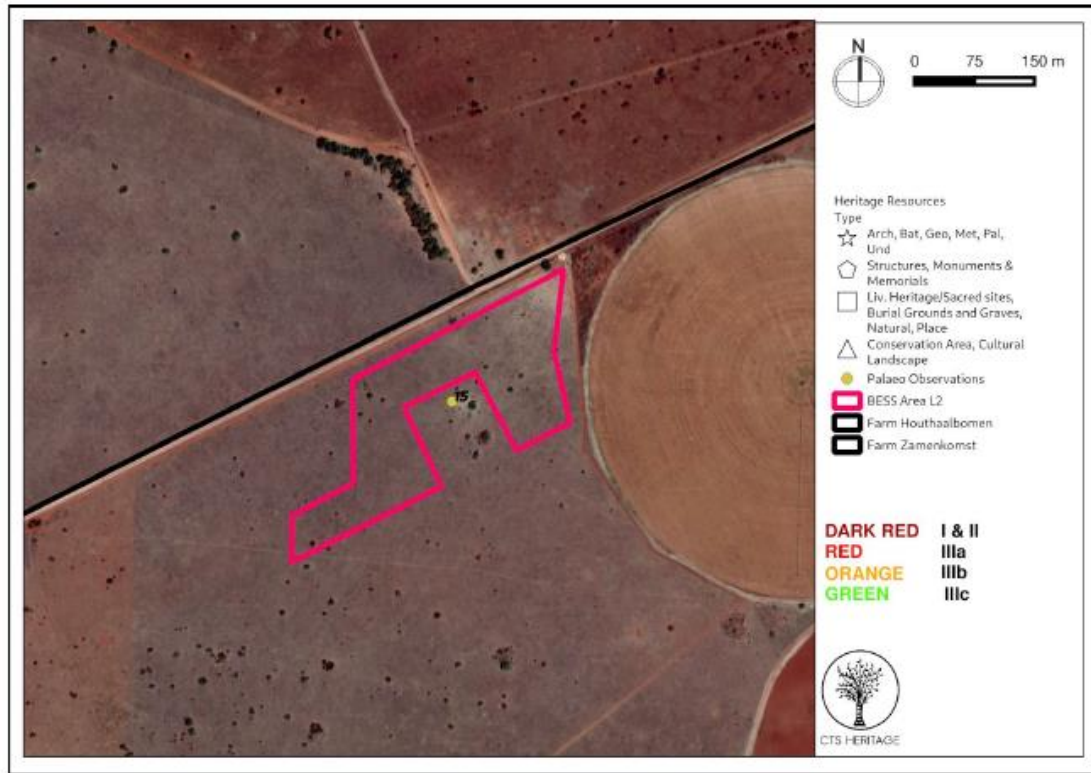


Figure 5.3: A map showing the location of the BESS development area within the authorised development footprint of Lichtenburg 2 as well as the archaeological sites identified within the vicinity.

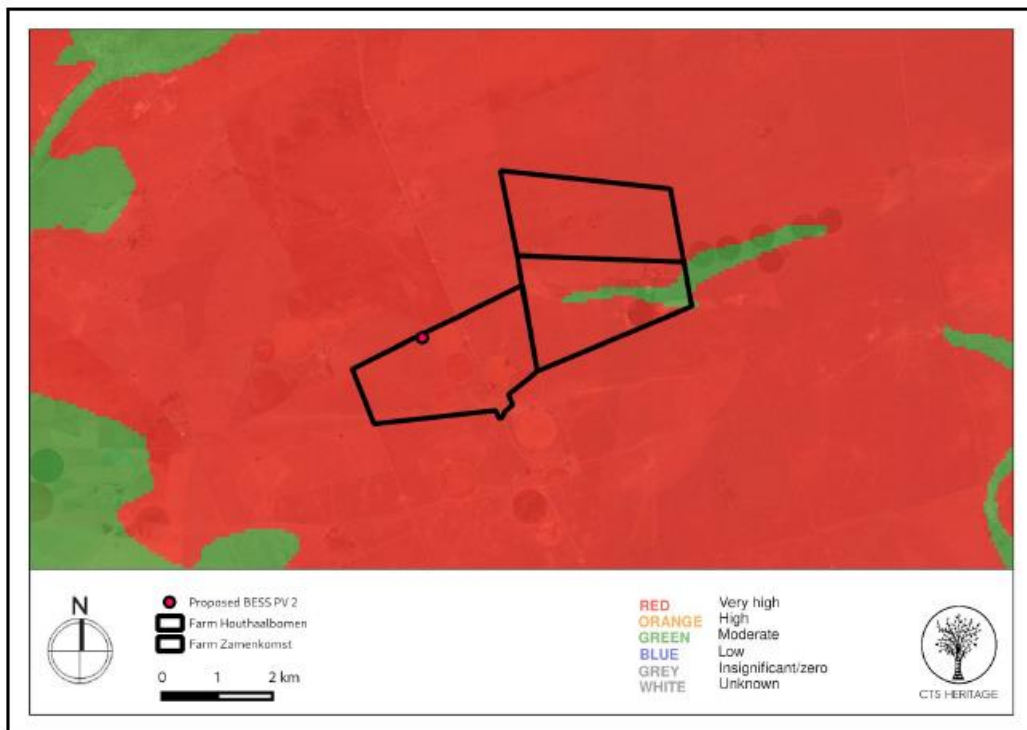


Figure 5.4: A map showing palaeosensitivity of the development footprint of Lichtenburg 2. The proposed construction and operation of the BESS will be placed within the authorised development footprint.

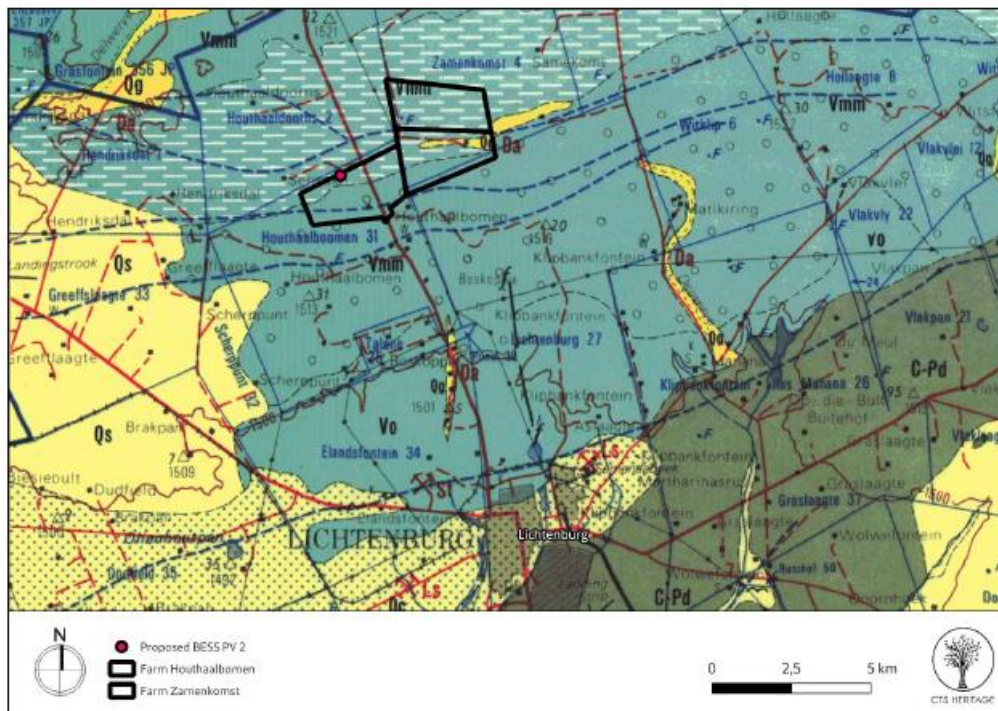


Figure 5.5: A geological map extract showing rocks of the Chuinespoort Group and the Malmani Subgroup within which the authorised development footprint of Lichtenburg 2 is located, as well as the BESS.

5.6.1. Cumulative Assessment

No additional heritage cumulative impacts were identified by the specialist as a result of the proposed amendment. Therefore, the cumulative impacts identified by the HIA (Lavin, 2018) remain unchanged and would be applicable for the proposed amendment.

5.6.2. Conclusion

The specialist concluded that based on the findings of the HIA, there is no objection to the authorisation of the proposed amendment for Lichtenburg 2 based on the following:

- » No archaeological resources, graves or burial grounds were identified within the authorised development footprint of the solar energy facility including the BESS location. It must be considered that graves are subterranean in nature and might not have been identified during the field work undertaken as part of the EIA; and
- » Based on the experience of the palaeontologist and the lack of any previously recorded fossils from the area, it is extremely unlikely that any fossils would be preserved in the stromatolites or overlying soils of the Quaternary.

Should concentrations of archaeological heritage material and human remains be discovered during the construction phase, all work must cease immediately and be reported to the South African Heritage Resources Agency (SAHRA) so that systematic and professional investigations / excavations can be undertaken in accordance with Objective 8 of the Construction Phase EMPr (refer to **Appendix H** of the Motivation Report). In addition, this recommendation was included in the EIA process and is therefore not a new recommendation as a result of the Part 2 Amendment process.

5.7. Visual Impacts

The visual specialist (Visual Specialist Addendum Letter (**Appendix F**)) has indicated that the addition of the BESS is not expected to significantly alter the area of potential visual exposure and is therefore not expected to significantly alter the influence of the Lichtenburg 2 on areas of higher viewer incidence (observers travelling along arterial/main or major secondary roads within the region) or potential sensitive visual receptors (residents of homesteads in close proximity to the solar energy facility).

5.7.1. Cumulative Assessment

No additional cumulative visual impacts were identified by the specialist as a result of the proposed amendment. Therefore, the impacts identified by the Visual Impact Assessment (du Plessis, 2018) remain unchanged and would be applicable to the proposed amendment.

5.7.2. Conclusion

Considering the addition of the BESS, there is no change to the significance of the impacts when considering the Visual Impact Assessment. No additional impacts are expected to occur and no additional or new mitigation measures are required. The development of the BESS is expected to have a neutral effect from a visual perspective, i.e. no advantages or disadvantages are expected.

The specialist confirms that the development of the BESS is supported from a visual perspective, subject to the implementation of the recommendations and mitigation measures included as part of the Visual Impact Assessment (du Plessis, 2018).

5.8. Impacts on the Social Environment

The findings of the Social Impact Assessment (SIA) (Watson, 2018) undertaken for Lichtenburg 2 indicated that the development of the solar energy facility and the associated infrastructure would create employment and business opportunities for locals during both the construction and operation phases of the project. The development of renewable energy was identified as a key growth sector by the local and district municipalities and represents an investment in clean, renewable energy infrastructure, which given the challenges created by climate change represents a positive social benefit for society as a whole. The Social Specialist Addendum Letter (**Appendix G**) addresses potential changes or impacts as a result of the proposed amendment by comparison with the original social impact assessment undertaken in 2018 as part of the EIA process.

The Social Specialist Addendum Letter (**Appendix G**) indicated that the proposed amendment for Lichtenburg 2 would not result in additional impacts from a social perspective and the impacts and mitigation measures included in the SIA would remain unchanged and applicable for the proposed amendment.

5.8.1. Cumulative Assessment

No additional cumulative social impacts were identified by the specialist as a result of the proposed amendment. Therefore, the impacts identified by the Social Impact Assessment (Watson, 2018) remain unchanged and would be applicable for the proposed amendment.

5.8.2. Conclusion

Based on the nature of the proposed amendment for Lichtenburg 2, and the fact that the proposed BESS falls within the project site and development footprint which was fully assessed as part of the SIA (Watson, 2018), it can be concluded that the proposed amendment will not lead to any additional impacts other than those identified and assessed within the SIA. No change in the significance of the impacts is expected to occur and there is no need for any additional recommendations or mitigation measures other than those already specified in the SIA (Watson, 2018). As a result, the proposed amendment is considered to be acceptable from a social perspective and can be approved, subject to the implementation of the recommended mitigation and enhancement measures as specified in the SIA.

6. RISKS ASSOCIATED WITH THE PROPOSED AMENDMENT

Possible risks associated with the construction and operation of the BESS from a technical perspective within the authorised development footprint of Lichtenburg 2 are limited to health and safety aspects during the project life cycle of the BESS as well as the solar energy facility. The risks identified for the construction and operation of the BESS are detailed below. Mitigation measures have been included within the project EMPr (refer to **Appendix H** of the Motivation Report).

Nature of Risk	Likelihood	Impact	Mitigation / Management of Risk
<p>1. <u>Mechanical breakdown / Exposure to high temperatures</u></p> <ul style="list-style-type: none"> » Incidents where the batteries are broken or exposed to temperature above room temperature could lead to overheating as well as fires which can affect infrastructure components of the BESS. » Leakages of substances contained within the battery cells (should they not be assembled off-site). 	Low	<ul style="list-style-type: none"> » Fires, electrocutions and spillage of toxic substances into the surrounding environment. » Spillage of hazardous substances into the surrounding environment. » Soil contamination – leachate from spillages which could lead to an impact of the productivity of soil forms in affected areas. » Water Pollution – spillages into surrounding watercourses as well as groundwater. » Health impacts – on the surrounding communities, particularly those relying on watercourses (i.e. rivers, streams, etc) as a primary source of water. 	<ul style="list-style-type: none"> » Operators are trained and competent to operate the BESS. Training should include the discussion of the following: <ul style="list-style-type: none"> * Potential impact of electrolyte spills on groundwater; * Suitable disposal of waste and effluent; * Key measures in the EMPr relevant to worker's activities; * How incidents and suggestions for improvement can be reported. » Training records should be kept on file and be made available during audits. » Battery supplier user manuals safety specifications and Material Safety Data Sheets (MSDS) are filed on site at all times. » Compile method statements for approval by the Technical/SHEQ Manager for the operation and management and replacement of the battery units / electrolyte for the duration of the project life cycle. Method statements should be kept on site at all times. » Provide signage on site specifying the types of batteries in use and the risk of exposure to hazardous material and electric shock. Signage should also specify how electrical and chemical fires should be dealt with by first responders, and the potential risks to first responders (e.g. the inhalation of toxic fumes, etc.). » Firefighting equipment should readily be available at the BESS area and within the site.

Nature of Risk	Likelihood	Impact	Mitigation / Management of Risk
			<ul style="list-style-type: none"> » Maintain strict access control to the BESS area. » Ensure all maintenance contractors / staff are familiar with the supplier's specifications. » Undertake daily risk assessment prior to the commencement of daily tasks at the BESS. This should consider any aspects which could result in fire or spillage, and appropriate actions should be taken to prevent these. » Standard Operating Procedures (SOPs) should be made available by the Supplier to ensure that the batteries are handled in accordance with required best practices. » Spill kits must be made available to address any incidents associated with the flow of chemicals from the batteries into the surrounding environment. » The assembly of the batteries on-site should be avoided as far as possible. Activities on-site for the BESS should only be limited to the placement of the container wherein the batteries are placed. » Undertake periodic inspections on the BESS to ensure issues are identified timeously and addressed with the supplier where relevant. » The applicant in consultation with the supplier must compile and implement a Leak and Detection Monitoring Programme during the project life cycle of the BESS. » Batteries must be strictly maintained by the supplier or suitably qualified persons for the duration of the project life cycle. No unauthorised personnel should be allowed to maintain the BESS.
<p>2. <u>Generation of hazardous waste</u></p> <ul style="list-style-type: none"> » The incorrect disposal of the batteries and the associated components could have an adverse impact on the environment. 	Medium	<ul style="list-style-type: none"> » Spillage of hazardous substances into the surrounding environment. » Soil contamination – leachate from the disposed batteries into the soil, which could lead to an impact of the productivity of soil forms in affected areas. 	<ul style="list-style-type: none"> » Damaged and used batteries must be removed from site by the supplier or any other suitably qualified professional for recycling or appropriate disposal. » The applicant should obtain a cradle to grave battery management plan from the supplier during the planning and design phase of the system. The plan must be kept on site and adhered to.

Nature of Risk	Likelihood	Impact	Mitigation / Management of Risk
		<ul style="list-style-type: none"> » Water Pollution – leachate from the disposed batteries spilling into surrounding watercourses as well as groundwater. » Health impacts – on the surrounding communities, particularly those relying on watercourses (i.e. rivers, streams, etc) as a primary source of water. 	

Based on the above it can be concluded that the construction and operation of the BESS within the authorised development footprint of Lichtenburg 2 will result in negligible risks from an environmental perspective and can be appropriately managed.

7. ADVANTAGES AND DISADVANTAGES OF THE PROPOSED AMENDMENT

In terms of Regulation 32(1)(a)(ii), this section provides details of the advantages and disadvantages of the proposed amendment.

Advantages of the amendment	Disadvantages of the amendment
General	
<p>The construction and operation of the BESS will allow for extended generation hours for the solar energy facility, as stored energy from the solar energy facility can be released into the grid during hours when the solar energy facility would not usually be operational. This will negate the need to construct additional power facilities to provide 100MW of electricity to the grid when the solar energy facility will be operating.</p> <p>The BESS will also provide grid strengthening and quality improvement, frequency control and voltage stabilisation.</p>	<p>None.</p>
Ecology and Hydrology, Avifauna, Soils, Heritage and Visual	
<p>The construction and operation of the BESS will allow for extended generation hours for the solar energy facility, as stored energy from the solar energy facility can be released into the grid during hours when the solar energy facility would not usually be operational. This will negate the need to construct additional power facilities to provide 100MW of electricity to the grid when the solar energy facility will be operating.</p> <p>Therefore, the utilisation of the BESS within the authorised footprint of the solar energy facility reduces environmental impacts from an ecological (including hydrology), soils and agricultural potential, heritage, palaeontology, and visual perspective.</p>	<p>None.</p>
Social	
<p>The construction and operation of the BESS will allow for extended generation hours for the solar energy facility, as stored energy from the solar energy facility can be released into the grid during hours when the solar energy facility would not usually be operational.</p>	<p>None</p>

Based on the above, it can be concluded that the advantages of the proposed amendment outweigh the disadvantages of the proposed amendment from an environmental and technical perspective.

8. REQUIREMENTS FOR ADDITIONAL MITIGATION AS A RESULT OF THE PROPOSED AMENDMENT

As required in terms of Regulation 32(1)(a)(iii), consideration was given to the requirement for additional measures to ensure avoidance, management and mitigation of impacts associated with the proposed change. From the specialist inputs provided into this Motivation Report, it is concluded that the impacts identified as a result of the proposed amendment are acceptable from an environmental perspective. As a result of the proposed amendment, the following recommendations are applicable from an avifauna perspective:

- » The electrochemical battery energy storage system should be contained or covered (to prevent access to the batteries); and
- » Any above-ground cables connecting to the BESS with the on-site facility substation should be covered with insulating material to prevent the risk of potential electrocutions should any large bird species interact in any manner with the BESS.

In general, the recommended mitigation measures included in the EIA Report as well as the EMPr (refer to **Appendix H** of the Motivation Report) would manage the anticipated impacts to acceptable levels. The EMPr of the solar energy facility has been updated to include the recommendations of the avifauna specialist and the mitigation measures included in the Risk Assessment for the operation of the BESS from a technical perspective.

9. PUBLIC PARTICIPATION

A public participation process is being conducted in support of the Amendment Application to amend the Environmental Authorisation (DEA Ref: 14/12/16/3/3/2/1092) issued for Lichtenburg 2. The Public Participation has been undertaken in accordance with the Public Participation Plan which has been submitted to the Department of Environment, Forestry and Fisheries (DEFF) and subsequently approved, which is in-line with Regulations 41- 44 of the EIA Regulations, 2014, and includes:

- » Placement of site notices at the site on **23 September 2020** (refer to **Appendix G4**).
- » The Motivation Report has been made available for the 30-day review and comment period from **Friday, 16 October 2020** to **Monday, 16 November 2020** on the Savannah Environmental website: <https://www.savannahsa.com/public-documents/energy-generation/>. CD copies are available on request from the project team.
- » Written notifications to registered I&APs as well as Organs of State regarding the availability of the Motivation Report were distributed on **14 October 2020** (refer to **Appendix G2** and **Appendix G3**).
- » Placement of an advertisement in the Noordwester newspaper on **15 October 2020** announcing the availability of the Motivation Report for a 30-day review and comment period. The tear sheet of the newspaper advert is included in **Appendix G4**.

No comments have been received to date. Comments received during the 30-day review and comment period will be included as **Appendix G5** in the final submission of the Motivation Report to the DEFF for consideration in the decision-making process. Comments will be included and responded to in the Comments and Responses Report (to be included as **Appendix G6**). Proof of attempts made to obtain comments from relevant Organs of State and key stakeholders will also be included in **Appendix G3**.

10. CONCLUSION

Based on the nature of the proposed amendment for Lichtenburg 2, the specialist findings, the fact that the proposed BESS development footprint avoids areas of high environmental sensitivity (refer to **Figure 9.1**), and that the proposed BESS falls within the project site and development footprint which was fully assessed and authorised for the development of the solar energy facility as part of the EIA in 2019, it can be concluded that the proposed amendment will not lead to any additional impacts or risks other than those identified and assessed within the EIA.

In terms of the impacts identified in the EIA relating to ecology (including hydrology), avifauna, soil and agricultural potential, heritage, visual and social aspects, it was concluded that the proposed amendment will not increase the significance of these impacts originally identified and assessed in the EIA or lead to any additional impacts. As a result, the impacts identified during the EIA of Lichtenburg 2 remain unchanged and applicable for the proposed amendment. Furthermore, the proposed amendments do not constitute a listed activity and the mitigation measures recommended in the EIA and in this Motivation Report are adequate to manage the expected impacts as a result of the proposed amendment.

Therefore, taking into consideration the conclusions from the specialist addendum letters (**Appendix A – F**), and the findings of this report, it is concluded that the proposed amendment is acceptable from an environmental perspective, subject to the implementation of the recommended mitigation measures included in the EIA as well as the Environmental Management Programme (EMPr) (**Appendix H**) for Lichtenburg 2.

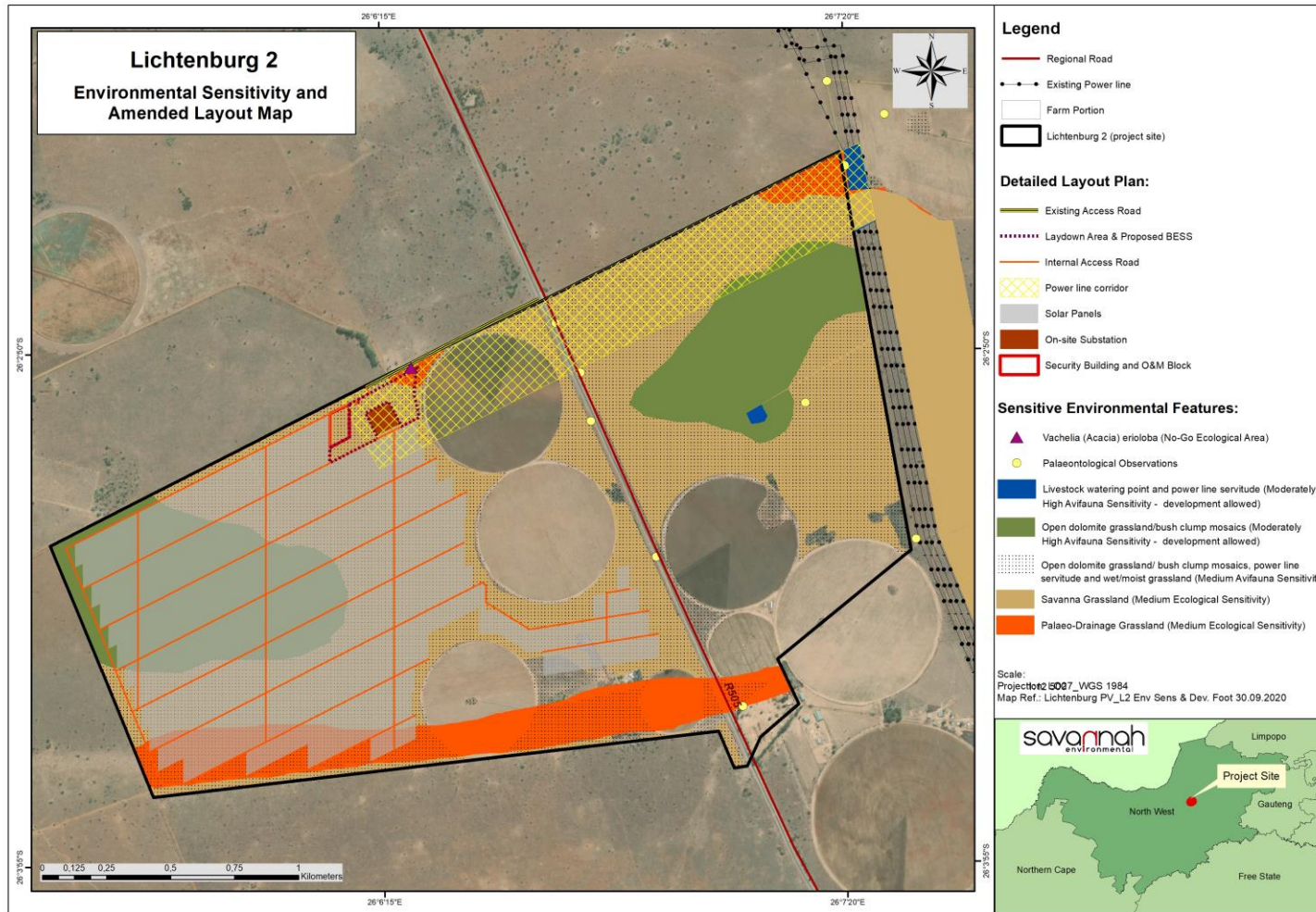


Figure 9.1 Environmental sensitivity map showing the location of the BESS development footprint (within the authorised laydown area) and the PV panel area located outside of areas of high environmental sensitivity. A3 Maps are included in **Appendix I** of the Motivation Report.

