BATTERY ENERGY STORAGE SYSTEM (BESS) AND ASSOCIATED INFRASTRUCTURE AT GUNSTFONTEIN WIND ENERGY FACILITY, NORTHERN CAPE PROVINCE

Basic Assessment Report

October 2020

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PROJECT DETAILS

Title	:	BESS and Associated Infrastructure for the Gunstfontein Wind Energy Facility, Northern Cape Province
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Client	:	Gunstfontein Wind Farm (Pty) Ltd
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When used as a reference this report should be cited as: Savannah Environmental October (2020) Basic Assessment Report for the BESS and Associated Infrastructure for the Gunstfontein Wind Energy Facility, Northern Cape Province.

PURPOSE OF THE BASIC ASSESSMENT REPORT AND INVITATION TO COMMENT

Gunstfontein Wind Farm (Pty) Ltd has appointed Savannah Environmental as the independent environmental consultant to undertake the Basic Assessment (BA) for the Battery Energy Storage System (BESS) and Associated Infrastructure for the authorised Gunstfontein Wind Energy Facility, Northern Cape. The BA process is being undertaken in accordance with the requirements of the 2014 EIA Regulations promulgated in terms of the National Environmental Management Act (NEMA; Act No. 107 of 1998).

This Basic Assessment (BA) report has been compiled in accordance with Appendix 1 of the EIA Regulations, 2014 (as amended) and consists of the following sections:

- **Chapter 1** provides background to the Gunstfontein BESS and the BA process.
- **Chapter 2** provides a description of the proposed development, the identified and assessed project alternatives and the need and desirability of the project.
- **Chapter 3** outlines the approach to undertaking the BA process and the strategic regulatory and legal context for energy planning in South Africa, specifically relating to the Gunstfontein BESS.
- **Chapter 4** describes the approach to undertaking the basic assessment process, the legal requirements as per the EIA regulations and the relevant legislative permitting requirements
- **Chapter 5** provides a description of the existing biophysical, regional, and social environment within and surrounding the study area.
- **Chapter 6** provides an assessment of the potential impacts associated with the proposed development and presents recommendations for the mitigation of significant impacts.
- **Chapter 7** provides an assessment of the cumulative impacts associated with the proposed development and presents recommendations for the mitigation of significant impacts.
- **Chapter 8** presents the conclusions and recommendations based on the findings of the BA Report.
- **Chapter 9** provides the references used in the compilation of the BA Report.

The BA report is available for review from **16 October 2020 – 16 November 2020** at the following locations:
- www.savannahSA.com

Please submit your comments by **16 November 2020** to:
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Comments can be made as written submission via fax, post or email.

EXECUTIVE SUMMARY

Gunstfontein Wind Farm (Pty) Ltd proposes the construction and operation of a Battery Energy Storage System (BESS) and associated infrastructure at the authorised Gunstfontein Wind Energy Facility (DEFF Ref: 14/12/16/3/3/2/826), near Sutherland, Northern Cape Province. The project will include the development of the BESS of up to 4ha in extent to be located near to (within 500m of) the Wind Energy Facility (WEF) substation. Associated infrastructure includes MV cabling (33kV or less to be constructed underground or overhead) connecting the BESS to the authorised WEF substation, and an access road. The access road will be up to 8m in width (6m wide road surface with 1m drains either side) to allow large trucks to access the BESS. The length of the road will depend on where the BESS is micro-sited within the 500m assessment zone around the WEF substation, but will not exceed 500m. The general purpose and utilisation of a Battery Energy Storage System (BESS) is to save and store excess electrical output as it is generated, allowing for a timed release of electricity to the grid when the capacity is required. BESS systems therefore provide flexibility in the efficient operation of the electricity grid through decoupling of the energy supply and demand. The BESS is envisaged to become an integral component of the authorised WEF, allowing for the storage of energy and extension of the generation period of the WEF.

The infrastructure considered within this Basic Assessment process includes:

- A Battery Energy Storage System (BESS) inside containers or similar housing structures with a footprint of up to 4ha in extent. Both Lithium-ion and Redox-flow technology are being considered for the project, depending on which is most feasible at the time of implementation.
- An 8m wide access road to the BESS (6m wide road surface with 1m drainage on each side of the road) branching off of the WEF roads, and internal roads (up to 8m wide) within the footprint of the BESS, as needed.
- MV Cabling (underground or overhead) between the BESS and the WEF substation.
- Fencing around the BESS for increased security measures.
- Temporary laydown area within the 4ha footprint of the BESS.
- Possible firebreak around the BESS facility, to be located within the 4ha BESS footprint

The BESS facility and all associated infrastructure will be located within the remainder of Farm Gunstfontein 131, Sutherland. The affected property has been identified by the applicant as the preferred project site suitable for the development of a BESS, based on the requirement for the BESS to be located in close proximity to the approved WEF substation.

An area of ~500m around the boundary of the Gunstfontein WEF Substation was assessed, to allow for the optimization of the placement of the BESS.

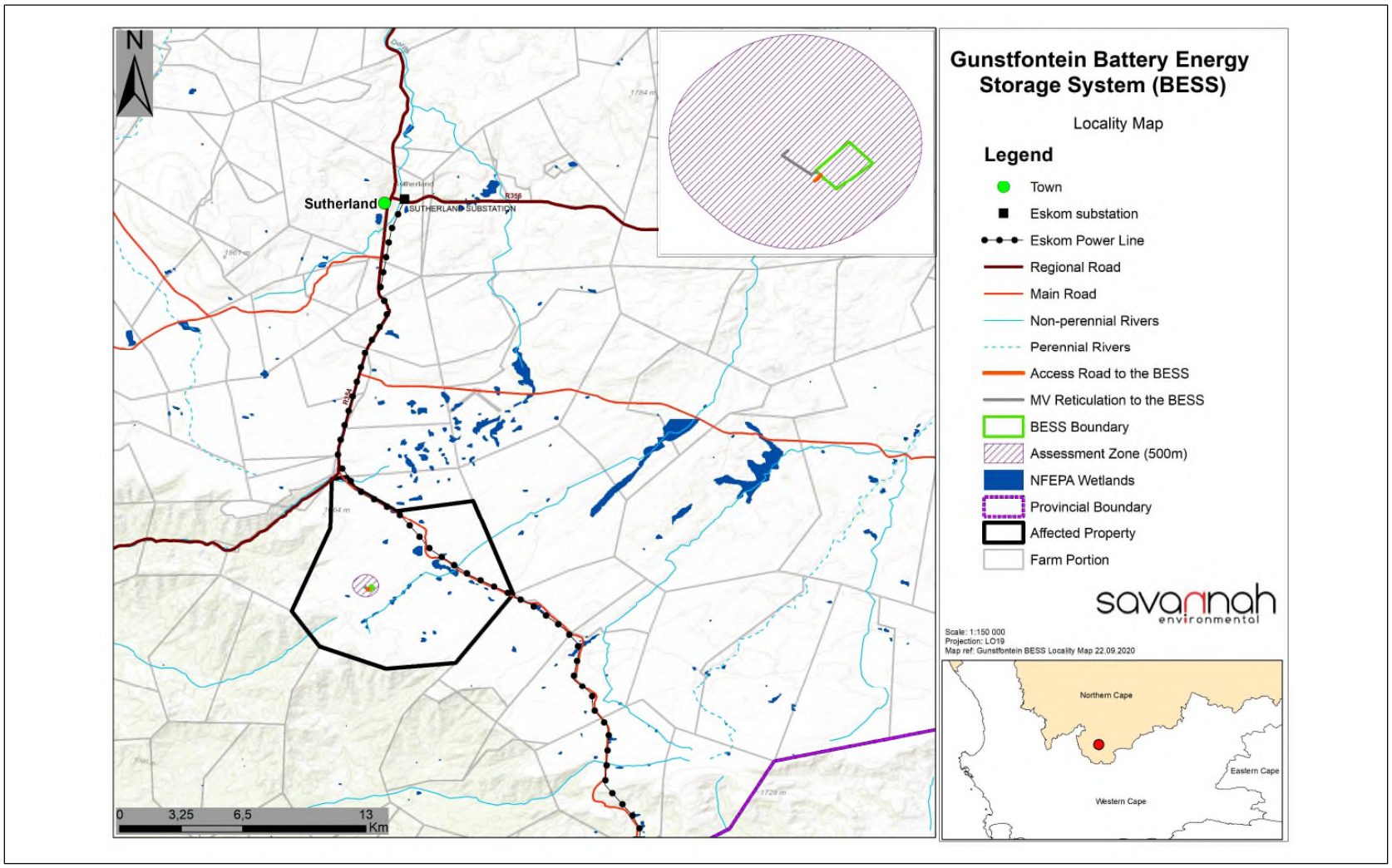

Figure 1: Locality map showing the 500m assessment zone surrounding the Gunstfontein Substation proposed for the development of the BESS and associated infrastructure for the authorised Gunstfontein Wind Energy Facility.

Specialist studies undertaken in support of this application were as identified through the DEFF online screening tool, and were required to be undertaken in accordance with the relevant Specialist Protocols (GNR320 of 20 March 2020). In this regard, and based on experience within the study area, the following specialist studies have been undertaken:

Ecological Impacts - From the findings of the Ecological Impact Assessment it can be concluded that there are no impacts associated with the establishment of Gunstfontein BESS that cannot be mitigated to a low significance. Although cumulative impacts in the area are a concern due to the high density of wind energy developments in the area, the contribution of the Gunstfontein BESS would be low and is not considered to be of significance. As such, there are no fatal flaws or high post-mitigation impacts that should prevent the development from proceeding. Based on the preliminary layout provided for the assessment, and the 500m assessment region, the Gunstfontein BESS can be supported from a terrestrial ecology point of view provided it is located within the areas of moderate or low ecological sensitivity within the 500m assessment region.

Impacts on Heritage Resources – Impacts on archaeology, palaeontology and cultural landscape have been assessed, and no fatal flaws have been identified from a heritage perspective. The significance of the impacts will be low, with the implementation of the recommended mitigation measures. The development of the BESS is considered to be acceptable, subject to the implementation of the recommendations made by the specialist.

Agricultural Impacts – From the findings of the Agricultural Compliance Report, obtained through desktop studies as well as baseline data gathered on site it was concluded that the area is considered to have Low to Medium Sensitivity to the proposed development. The soil forms observed within the project assessment zone confirmed the details of the land type analysis that indicates very low suitability of these areas for arable crop production. The dominant soil forms identified in Gunstfontein BESS project assessment zone are solid rock, Mispah and shallow Bethesda profiles. Further to the low soil suitability, the arid climate (accompanied by long drought spells) from time to time, makes these areas not suitable for rainfed agriculture.

Noise Impacts – The majority of the noise impacts associated with the development of the BESS will have a very low impact. The noise from the climate control system of the BESS is significantly less than the noise that will be generated by the wind turbines of the proposed Gunstfontein WEF and these noises will not cumulatively add to the noise of the WEF. No specific mitigation measures regarding noise or additional noise measurements are recommended. It is therefore recommended that the Gunstfontein BESS project be approved from an acoustic perspective.

Cumulative Impacts - The contribution of the project to cumulative impacts will be of low significance. There are no identified impacts considered as presenting an unacceptable risk. In addition, no impacts that will result in whole-scale change are expected.

Overall, no environmental fatal flaws were identified from the specialist studies conducted for the Gunstfontein BESS for the Gunstfontein Wind Energy Facility, provided the BESS is located in areas of moderate or low ecological sensitivity within the 500m assessment area. Although a sensitive drainage line traverses the assessment zone, there is sufficient area available to accommodate the BESS within the low/medium sensitivity parts of the site. Provided that the BESS is located within the low/medium sensitivity parts of the site, the impacts associated with the BESS would be low.

All impacts associated with the project establishment within the BESS 500m assessment zone can be mitigated to acceptable levels or enhanced through the implementation of the recommended mitigation or enhancement measures. **Figure 2** provides an environmental sensitivity map of the BESS 500m assessment zone assessed as part of the BA process, as well as the environmental sensitivities identified

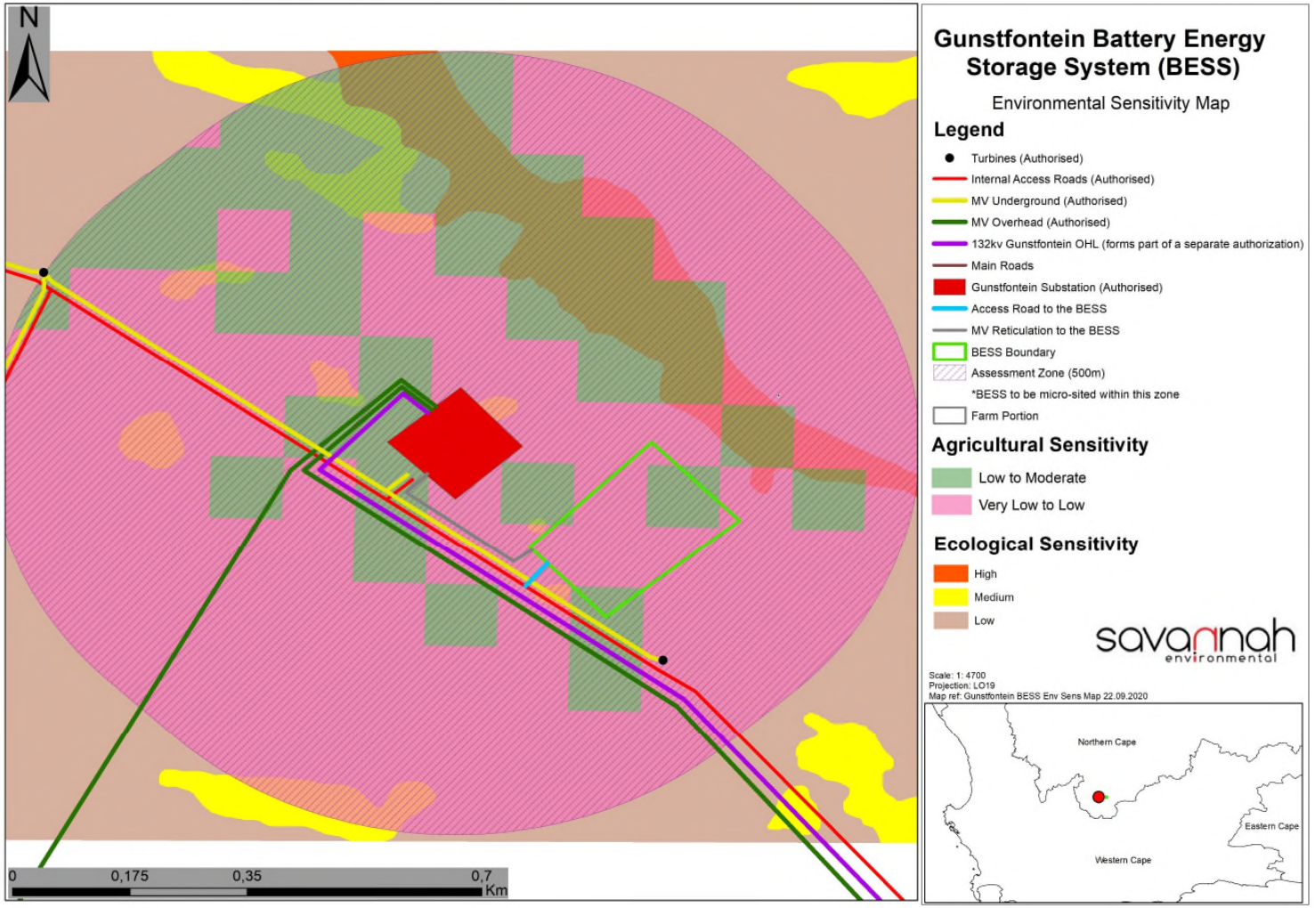

Figure 3: Environmental sensitivity map for the BESS 500m Assessment Zone surrounding the Gunstfontein Substation.

DEFINITIONS AND TERMINOLOGY

Alternatives: Alternatives are different means of meeting the general purpose and need of a proposed activity. Alternatives July include location or site alternatives, activity alternatives, process or technology alternatives, temporal alternatives or the 'do nothing' alternative.

Commence: The start of any physical activity, including site preparation and any other activity on site furtherance of a listed activity or specified activity, but does not include any activity required for the purposes of an investigation or feasibility study as long as such investigation or feasibility study does not constitute a listed activity or specified activity.

Commissioning: Commissioning commences once construction is completed. Commissioning covers all activities including testing after all components of the wind turbine are installed.

Construction: Construction means the building, erection or establishment of a facility, structure or infrastructure that is necessary for the undertaking of a listed or specified activity. Construction begins with any activity which requires Environmental Authorisation.

Cumulative impacts: Impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities (e.g. discharges of nutrients and heated water to a river that combine to cause algal bloom and subsequent loss of dissolved oxygen that is greater than the additive impacts of each pollutant). Cumulative impacts can occur from the collective impacts of individual minor actions over a period and can include both direct and indirect impacts.

Decommissioning: To take out of active service permanently or dismantle partly or wholly, or closure of a facility to the extent that it cannot be readily re-commissioned. This usually occurs at the end of the life of a facility.

Direct impacts: Impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity (e.g. noise generated by blasting operations on the site of the activity). These impacts are usually associated with the construction, operation, or maintenance of an activity and are generally obvious and quantifiable.

'Do nothing' alternative: The 'do nothing' alternative is the option of not undertaking the proposed activity or any of its alternatives. The 'do nothing' alternative also provides the baseline against which the impacts of other alternatives should be compared.

Endangered species: Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating. Included here are taxa whose numbers of individuals have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to be in immediate danger of extinction.

Emergency: An undesired/ unplanned event that results in a significant environmental impact and requires the notification of the relevant statutory body, such as a local authority.

Endemic: An "endemic" is a species that grows in a particular area (is endemic to that region) and has a restricted distribution. It is only found in a particular place. Whether something is endemic or not depends on the geographical boundaries of the area in question and the area can be defined at different scales.

Environment: the surroundings within which humans exist and that are made up of:

i. The land, water and atmosphere of the earth;
ii. Micro-organisms, plant and animal life;
iii. Any part or combination of (i) and (ii) and the interrelationships among and between them; and
iv. The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental impact: An action or series of actions that have an effect on the environment.

Environmental management: Ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the carrying capacity of the environment.

Environmental management programme: An operational plan that organises and co-ordinates mitigation, rehabilitation and monitoring measures in order to guide the implementation of a proposal and its ongoing maintenance after implementation.

Heritage: That which is inherited and forms part of the National Estate (Historical places, objects, fossils as defined by the National Heritage Resources Act of 2000).

Indigenous: All biological organisms that occurred naturally within the study area prior to 1800.

Indirect impacts: Indirect or induced changes that July occur because of the activity (e.g. the reduction of water in a stream that supply water to a reservoir that supply water to the activity). These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place because of the activity.

Interested and affected party: Individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups, and the public.

Method statement: A written submission to the ECO and the site manager (or engineer) by the EPC Contractor in collaboration with his/her EO.

Mitigation hierarchy: The mitigation hierarchy is a framework for managing risks and potential impacts related to biodiversity and ecosystem services. The mitigation hierarchy is used when planning and implementing development projects, to provide a logical and effective approach to protecting and conserving biodiversity and maintaining important ecosystem services. It is a tool to aid in the sustainable management of living, natural resources, which provides a mechanism for making explicit decisions that balance conservation needs with development priorities

No-go areas: Areas of environmental sensitivity that should not be impacted on or utilised during the development of a project as identified in any environmental reports.

Pollution: A change in the environment caused by substances (radio-active or other waves, noise, odours, dust or heat emitted from any activity, including the storage or treatment or waste or substances.

Pre-construction: The period prior to the commencement of construction, this July include activities which do not require Environmental Authorisation (e.g. geotechnical surveys).

Rare species: Taxa with small world populations that are not at present Endangered or Vulnerable but are at risk as some unexpected threat could easily cause a critical decline. These taxa are usually localised within restricted geographical areas or habitats or are thinly scattered over a more extensive range. This category was termed Critically Rare by Hall and Veldhuis (1985) to distinguish it from the more generally used word "rare."

Red data species: Species listed in terms of the International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species, and/or in terms of the South African Red Data list. In terms of the South African Red Data list, species are classified as being extinct, endangered, vulnerable, rare, indeterminate, insufficiently known or not threatened (see other definitions within this glossary).

Significant impact: An impact that by its magnitude, duration, intensity, or probability of occurrence July have a notable effect on one or more aspects of the environment.

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APPENDICES

CHAPTER 1: INTRODUCTION

Gunstfontein Wind Farm (Pty) Ltd proposes the construction and operation of a Battery Energy Storage System (BESS) at the authorised Gunstfontein WEF (DEFF Ref: 14/12/16/3/3/2/826) near Sutherland, Northern Cape Province. The BESS is proposed to be located on the Remainder of Farm Gunstfontein 131 (refer to **Table 1.1** and **Figure 1.1**) near to the WEF facility substation and will be up to 4ha in total extent. The general purpose and utilisation of a Battery Energy Storage System (BESS) is to save and store excess electrical output as it is generated, allowing for a timed release of electricity to the grid when the capacity is required. BESS systems therefore provide flexibility in the efficient operation of the electricity grid through decoupling of the energy supply and demand.

Table 1.1: Location of the BESS and associated infrastructure

Province	Northern Cape Province
District Municipality	Namakwa District Municipality (DC6)
Local Municipality	Karoo Hoogland Municipality
Ward number(s)	3
Nearest town(s)	Sutherland (+/- 20km) and Laingsburg (+/- 70km)
Affected Properties: Farm name(s), number(s) and portion numbers	**BESS and Associated Infrastructure:** » Remainder of Farm Gunstfontein 131; near Sutherland, Northern Cape
SG 21 Digit Code (s): Affected Properties	**BESS and Associated Infrastructure:** » Remainder of Farm Gunstfontein 131, Sutherland, Northern Cape: C07200000000013100000

Both Lithium-Ion ion and Redox-flow technology are being considered for the project, depending on which is most feasible at the time of implementation. The battery will be enclosed within one or more a container/s or similar housing structure/s. Associated infrastructure includes overhead or underground MV cabling (33kV or less) to connect the BESS to the WEF substation, and an access road (8m in width, with 6m wide road surface and 1m drain either side). An area of ~500m around the boundary of the WEF substation was assessed, to allow for the optimization of the placement of the BESS. The BESS is planned to become an integral component of the authorised WEF, allowing for the storage of additional energy and extension of the generation period of the WEF.

The development of the BESS will support the proposed Gunstfontein Wind Energy Facility, which is planned to be developed in accordance with the identified objectives of the national, provincial and local government to develop renewable energy facilities for power generation purposes. The project development site is located within the Komsberg Renewable Energy Development Zone (REDZ) and within the Central Corridor of the Strategic Transmission Corridors.

The nature and extent of the proposed BESS and associated infrastructure, as well as the potential environmental impacts associated with the construction, operation and decommissioning phases of the proposed infrastructure are assessed in this Basic Assessment Report. Site specific environmental issues and constraints within the BESS 500m assessment zone are considered within independent specialist studies in order to test the environmental suitability of the assessment zone for the proposed BESS project, delineate areas of sensitivity within the assessment zone, and ultimately inform the placement of the BESS infrastructure.

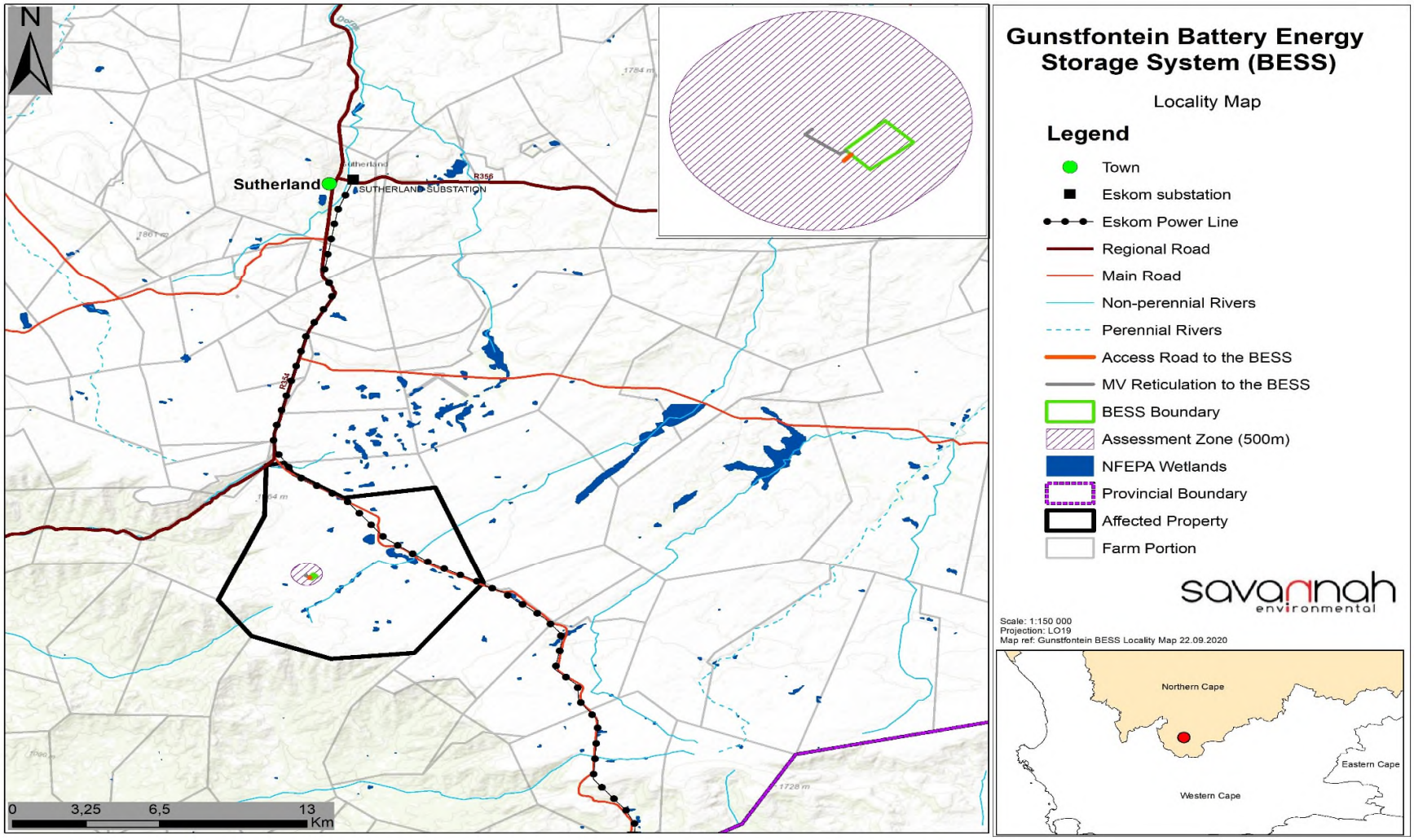

Figure 1.1: Locality map showing the location of the BESS 500m assessment zone for the authorised Gunstfontein Energy Facility (refer to Appendix I for A3 map).

1.1 Requirements for an Environmental Impact Assessment Process

The construction and operation of the BESS and associated infrastructure for the authorised Gunstfontein Wind Energy Facility is subject to the requirements of the EIA Regulations, 2014 (as amended), published in terms of Section 24(5) of the National Environmental Management Act (NEMA) 107 of 1998. NEMA is the national legislation that provides for the authorisation of certain controlled activities known as "listed activities". In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed, and reported on to the Competent Authority charged by NEMA with granting of the relevant environmental authorisation.

As the listed activities associated with the proposed BESS and associated infrastructure are Listing Notice 1 and Listing Notice 3 activities (refer to Chapter 4, Table 4.1 for details), the application for authorisation is required to be supported by a Basic Assessment process.

In terms of GNR 779 of 01 July 2016, the National Department of Environment, Forestry and Fisheries (DEFF) has been determined as the Competent Authority (CA) for all projects which relate to the Integrated Resource Plan for Electricity (IRP) 2010 – 2030, and any updates thereto. As this project is associated with a renewable energy development intended to form part of the country's national energy supply (which is included in the IRP), the DEFF is considered as the CA. Through the decision-making process, the DEFF will be supported by the Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform as the commenting authority.

1.2 Legal Requirements as per the EIA Regulations, 2014 (as amended)

This Basic Assessment Report (BAR) has been prepared in accordance with the requirements of the EIA Regulations published on 08 December 2014 (as amended in April 2017) promulgated in terms of Chapter 5 of the National Environmental Management Act (Act No 107 of 1998).

This chapter of the BAR Report includes the following information required in terms of the EIA Regulations - Appendix 1: Content of Basic Assessment Reports:

Requirement	Relevant Section
3(a) the details of the (i) EAP who prepared the report and (ii) the expertise of the EAP, including a curriculum vitae.	The details of the EAP who prepared the report and the expertise of the EAP is included in section 1.5. The curriculum vitae of the EAP, project team and independent specialists are included in **Appendix A**.
3(b) the location of the activity including (i) the 21 digit Surveyor General code of each cadastral land parcel, (ii) where available the physical address and farm name and (iii) where the required information in items (i) and (ii) is not available, the co-ordinates of the boundary of the property or properties.	The location of the BESS and associated infrastructure is included in section 1.3, Table 1.1 and **Figure 1.1**. The information provided includes the 21-digit Surveyor General code of the affected property and the farm name. Additional information is also provided regarding the location of the development which includes the relevant province, local and district municipalities, ward and current land zoning.

1.3 Details of the Environmental Assessment Practitioner and Expertise to conduct the BA process

In accordance with Regulation 12 of the 2014 EIA Regulations (GNR 326), Gunstfontein Wind Farm (Pty) Ltd has appointed Savannah Environmental (Pty) Ltd (Savannah Environmental) as the independent Environmental Assessment Practitioner to undertake the Basic Assessment and prepare the BA Report for the BESS and associated infrastructure for the authorised Gunstfontein Wind Energy Facility. Neither Savannah Environmental nor any of its specialists are subsidiaries of or are affiliated to Gunstfontein Wind Farm (Pty) Ltd. Furthermore, Savannah Environmental does not have any interests in secondary developments that may arise out of the authorisation of the proposed project.

Savannah Environmental is a specialist environmental consulting company providing a holistic environmental management service, including environmental assessment and planning to ensure compliance and evaluate the risk of development, and the development and implementation of environmental management tools. Savannah Environmental benefits from the pooled resources, diverse skills and experience in the environmental field held by its team.

The Savannah Environmental team have considerable experience in basic assessments and environmental management, and have been actively involved in undertaking environmental studies, for a wide variety of projects throughout South Africa, including those associated with electricity generation.

The Environmental Assessment Practitioners (EAPs) from Savannah Environmental responsible for this project include:

- **Gideon Raath**, the principle EAP for this project, holds an MSc (Geography and Environmental Management; SU), a BSc Honours (Ecology and Environmental Studies - Cum laude; Wits) and a BSc (Geography and Environmental Management; UJ). He is a registered professional with the South African Council for Natural Scientific Professions (SACNASP). Gideon's experience includes EIA permitting for ~72 different projects, ranging from infrastructure, mining, energy, housing, renewable energy and the conservation industries. These include Environmental Authorisations (BAR, S&EIR), Water Use Licencing, Waste Licencing, Environmental Compliance Officer compliance auditing, GIS studies and MPRDA permitting. He therefore has wide ranging experience in NEMA, NHRA, NEM:WA, NEM:BA, MPRDA and NWA regulations, having applied them for numerous private and public sector clients across various industries, for small, medium and large projects. Gideon is also an experienced Ecological & Wetland Specialist having conducted ~21 specialist studies, accredited with SACNASP as a professional natural scientist (Pr.Sci.Nat) since 2017. Gideon also has experience beyond the permitting sphere through numerous screening assessments for potential developers, including fatal flaw screenings, regulatory and permitting approval screening as well as ecological and hydrological sensitivity screening. Gideon has also served in an advisory role for various infrastructure and mining projects, assisting with environmental due diligence, bankable feasibility study input and assistance towards financial close.

- **Ethanne Soar**, the principle author of this report, holds a BScHONS (Geography and Environmental Science - With Distinction; University of Pretoria) and a BSc (Environmental Science – With Distinction; University of Pretoria). His BScHONS thesis involved a socio-spatial risk assessment and analysis of fortress conservation approaches to address rhino poaching in the context of two private and two public nature reserves in south Africa. Currently Ethanne is studying an MSc (Environmental Management) at the University of Pretoria which he plans to complete by the end of 2020.

Ethanne has worked as an Independent Environmental Consultant in 2019 for BECs (Pty) Ltd, where he was involved in conducting Environmental Authorisation Applications (NWA, NEMA, MPRDA, IWWMP), Public Participation Processes, Ground and Surface Water Quality Sampling, Stormwater Management Plans, Bathometric Assessments, Environmental Compliance Auditing and inspections on a weekly and monthly basis, Environmental Impact Assessments, Basic Assessments, GIS Specialisation, Risk Assessments, Planned Task Observations, IWUL Audit Reports, Quarterly Water Quality Status Reports, Extensive ECO Work, Game and Veld management and lastly Training Courses in: AcGIS (Offered by ESRI), ASPASA Environmental Conference and the Minerals Council Meeting/Workshop (Water Conservation and Demand Management Self-Assessment Tool Training).

» **Nicolene Venter** is responsible for the public participation process for the BA. She is a Board Member of IAPSA (International Association for Public Participation South Africa). She has over 21 years of experience in public participation, stakeholder engagement, awareness creation processes and facilitation of various meetings (focus group, public meetings, workshops, etc.). She is responsible for project management of public participation processes for a wide range of environmental projects across South Africa and neighbouring countries.

» **Jo-Anne Thomas** provides technical input for projects in the environmental management field, specialising in Strategic Environmental Advice, Environmental Impact Assessment studies, environmental auditing and monitoring, environmental permitting, public participation, Environmental Management Plans and Programmes, environmental policy, strategy and guideline formulation, and integrated environmental management. Her Key focus is on integration of the specialist environmental studies and findings into larger engineering-based projects, strategic assessment, and providing practical and achievable environmental management solutions and mitigation measures. Responsibilities for environmental studies include project management (including client and authority liaison and management of specialist teams); review and manipulation of data; identification and assessment of potential negative environmental impacts and benefits; review of specialist studies; and the identification of mitigation measures.

The EAP Declaration of Independence and Affirmation is included in **Appendix K**.

CHAPTER 2: PROJECT DESCRIPTION

This chapter provides an overview of the BESS infrastructure for the Gunstfontein Wind Energy Facility and details the project scope, which includes the planning/design, construction, operation and decommissioning activities required for the development.

2.1. Legal Requirements as per the EIA Regulations, 2014 (as amended)

This chapter of the BAR report includes the following information required in terms of the EIA Regulations, 2014 - Appendix 1: Content of Basic Assessment Reports:

Requirement	Relevant Section
3(b) the location of the activity including (i) the 21 digit Surveyor General code of each cadastral land parcel, (ii) where available the physical address and farm name and (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties.	The location of the proposed BESS and associated infrastructure for the Gunstfontein Wind Energy Facility is detailed in Chapter 1, **Table 1.1**, as well as in section 2.2.1 below.
3(c)(i)(ii) a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or on land where the property has not been defined, the coordinates within which the activity is to be undertaken	A layout map illustrating the BESS and associated infrastructure (with a 500m assessment zone surrounding the Gunstfontein WEF Substation) to be developed for the Gunstfontein Wind Energy Facility is included as **Figure 2.2**.
3(d)(ii) a description of the scope of the proposed activity, including a description of the activities to be undertaken including associated structures and infrastructure	A description of the activities to be undertaken with the development of the BESS and associated infrastructure is included in **Table 2.1** and **Table 2.2**.
3(f) a motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location.	The need and desirability of the development of the Gunstfontein BESS is included and discussed as a whole within section 2.2.
3(g) a motivation for the preferred site, activity and technology alternative	The motivation for the alternatives associated with the development of the BESS and associated infrastructure for the Gunstfontein Wind Energy Facility are included in section 2.3.
3(h)(i) details of the alternative considered	The details of all alternatives considered as part of the BESS and associated infrastructure for the Gunstfontein Wind Energy Facility are included in section 2.3.
3(h)(ix) the outcome of the site selection matrix	The site selection process followed by the developer in order to identify the site for the development of the BESS and associated infrastructure is described in section 2.3.
3(h)(x) if no alternatives, including alternative locations for the activity were investigation, the motivation for not considering such	Where no alternatives have been considered, motivation has been included. This is included in section 2.3.

2.2. Need and Desirability of the Gunstfontein BESS

Energy storage, specifically through the use of battery systems has recently gained considerable attention globally as the use of varied sources of energy becomes widespread. Electricity is not always produced at the exact time that it is needed, requiring temporary or long-term storage to allow for a regulated supply. This problem is most evident with base load power generation sources that are most efficient when running continuously, and thus produce power at times (at night, for example) when electricity demand is low. Additionally, alternatives to base load generation such as non-dispatchable variable Renewable Energy (RE) generators, can only provide power when the resource – commonly solar or wind - is available, at times when the energy is not necessarily required, further exacerbating the need for storage and the regulation of output energy from these facilities. The proposed Gunstfontein Wind Energy Facility BESS is proposed in order to store energy generated by the authorised Gunstfontein WEF for use after hours, when the facility is no longer generating electricity (i.e. when the wind is not providing energy to rotate turbines and generate electricity).

Given the relationship between, and the necessity of, the proposed BESS facility for the Gunstfontein Wind Energy Facility, similar need and desirability considerations to those applicable to the Gunstfontein Wind Energy Facility are applicable. These are aligned with national, regional, and local policies and plans, as detailed below:

- The need for the country to respond to the international commitments regarding climate change and reduction in carbon emissions.
- The need at a national level to diversify the power generation technology mix to include up to 14.4 GW of renewables by 2030, as defined in the Integrated Resource Plan (IRP), 2019 (as discussed in detail in **Chapter 3**).
- The need to align development with the requirements of the National Development Plan to address the identified socio-economic issues affecting development in South Africa.
- The need for sustainable development at a Provincial level, including the need to utilise its extensive resources for the benefits of the local area.
- The identification of the need for potential IPP projects to become operational in the local municipality as per the Karoo Hoogland Local Municipality Integrated Development Plan.

From an overall environmental sensitivity and planning perspective, the proposed BESS facility supports the broader strategic context of the municipality as it will be an integral part of a renewable energy facility which is considered a driver for economic growth in the region as per the Namaqua District Municipality's Integrated Development Plan. It is also in line with broader societal needs and the public interest as it is linked to a renewable energy facility (Gunstfontein Wind Energy Facility), for which there is national policy and support. No exceedance of social, ecological, heritage or avifaunal limits will result from the construction of the proposed BESS, and no significant disturbance of biological diversity is anticipated, as detailed in this Basic Assessment Report.

The project will not compromise IDP objectives but will assist in reaching these objectives as the IDP of the municipality aims to ensure that the quality of life of the Namakwa District community through purposeful and quality service, and the effective and optimal utilisation of resources is achieved. This project will assist in supporting the local and national electricity supply through its contribution to the National Eskom Grid as the BESS facility is directly linked to the Gunstfontein Wind Energy Facility. Moreover, the BESS will allow energy generated by the authorised WEF to be stored and released in response to electricity demand, thus ensuring

an extended energy supply window from the WEF. The project will further assist in minor local job creation which will further help achieve IDP objectives and inject money into the local and regional economy.

2.3 Nature and extent of the BESS and associated infrastructure for the Gunstfontein Wind Energy Facility

As detailed in Chapter 1, the BESS is proposed in close proximity to the authorised Gunstfontein WEF substation on the RE of Farm Gunstfontein 131, near Sutherland, Northern Cape. The infrastructure considered within this Basic Assessment process includes:

- A Battery Energy Storage System (BESS) inside containers with a footprint of up to 4ha in extent. Both Lithium-Ion and Redox-flow technology are being considered for the project, depending on which is most feasible at the time of implementation.
- An access road to the BESS (6m in width with 1m drainage on each side of the road branching off of the WEF roads (i.e. 8m in total)).
- MV Cabling (33kV or below, underground or overhead) between the BESS and the substation.
- Fencing around the BESS for increased security measures.
- Temporary laydown area within the 4ha footprint of the BESS.

A summary of the details and dimensions of the planned BESS and associated infrastructure associated with the project is provided in **Table 2.1.**

Table 2.1: Details of the proposed BESS and associated infrastructure for the Gunstfontein Wind Energy Facility.[1]

Infrastructure	Footprint, dimensions and details
Technology	Lithium-Ion or Redox-flow technology
BESS footprint	Up to 4ha in total extent, including foundation and containerised battery system
Capacity	Capacity of up to 1 200MWh Storage capacity of up to 6-8 hours
Access road to the BESS	This will branch off the WEF roads to the BESS and will be 8m in width (6m road surface + 1m drain either side) and a maximum of 500m in length
Medium Voltage cabling	33kV or less (underground or overhead) between the BESS and WEF substation.
Depth of excavation for the battery foundation and cabling	Maximum of 2m
Height of Development	Maximum of 4m
Fencing	Fencing around the entire footprint of the BESS will be installed for access restriction measures.
Laydown Area	Up to 1 ha located within the 4ha BESS footprint

Figure 2.1 illustrates the BESS and associated infrastructure proposed for the development of the BESS and associated infrastructure for the Gunstfontein Wind Energy Facility, which has been assessed within this BA report.

[1] The confirmed details and dimensions of the BESS infrastructure was assessed as part of the independent specialist studies.

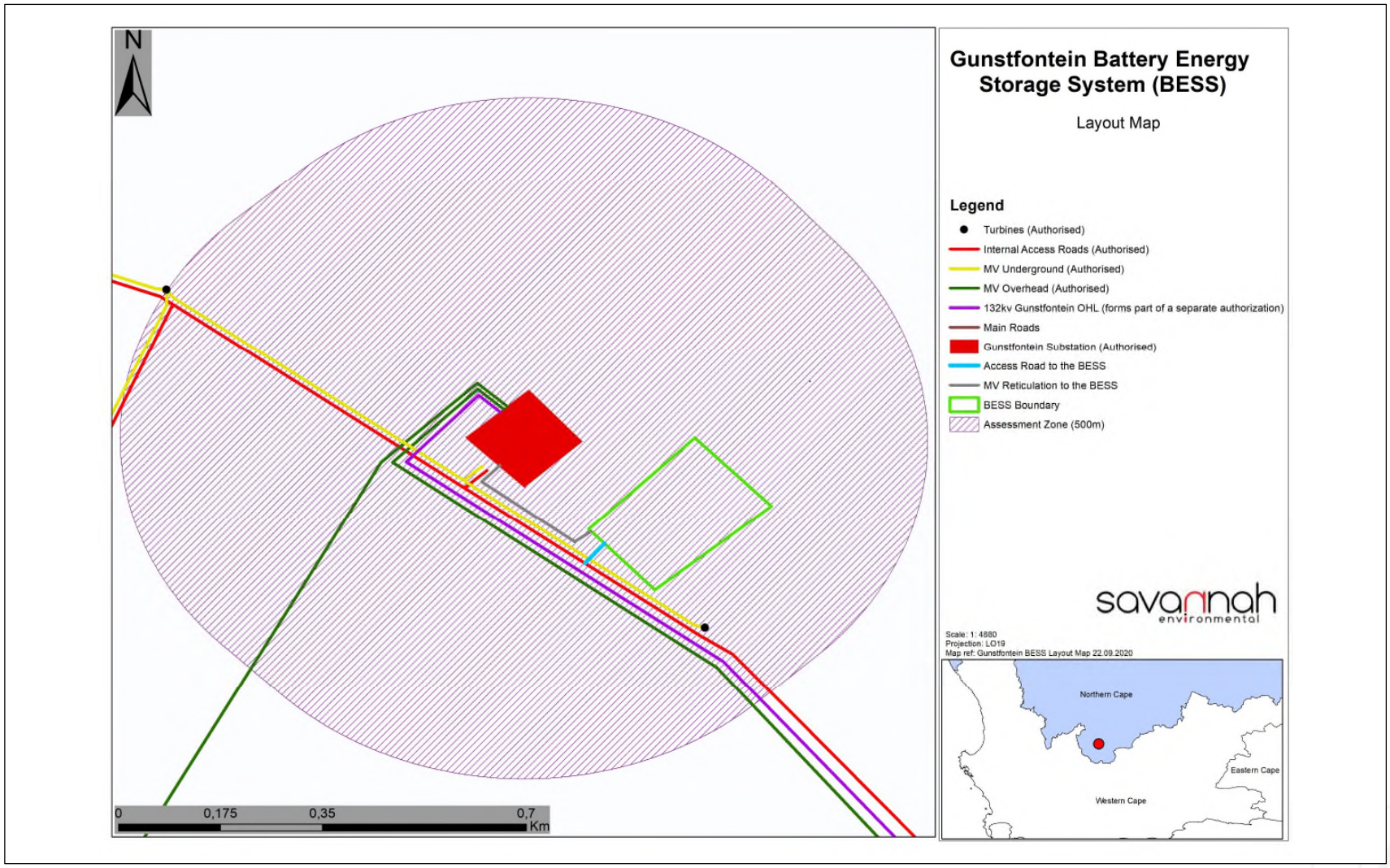

Figure 2.1: Layout Map for Gunstfontein BESS and associated Infrastructure for the Gunstfontein Wind Energy Facility (refer to Appendix I for A3 map)

2.2.3 Project Development Phases associated with the BESS and Associated Infrastructure for the Gunstfontein Wind Energy Facility

Table 2.2 provides the details regarding the requirements and the activities to be undertaken during the BESS and associated infrastructure development phases (i.e. construction phase, operation phase and decommissioning phase).

Table 2.2: Details of the BESS and associated Infrastructure development phases (i.e. construction, operation and decommissioning)

Construction Phase	
Requirements	» Duration of the construction phase is expected to be up to 12 months. » Create direct construction employment opportunities. Up to 15-20 employment opportunities will be created during the construction phase. » No on-site labour camps. Employees to be accommodated in the nearby towns such as Sutherland (+/- 20km) and Laingsburg (+/- 70km) and transported to and from site daily. » Overnight on-site worker presence would be limited to security staff. » Construction waste will be temporarily stored on site and waste removal and sanitation will be undertaken by a sub-contractor or appointed contractor on a regular basis. » Electricity required for construction activities will be generated by a generator or will be sourced from available Eskom distribution networks in the area. » Negligible water will be required for the construction phase and potable needs. If required, water will be sourced from the local municipality, existing borehole/s on or near the project site (subject to agreement with landowners and authorisation from DHSWS), or water will be extracted from any bulk water supply pipelines near the 500m assessment zone surrounding the Gunstfontein Substation.
Construction sequence	BESS are constructed in the following simplified sequence: » Step 1: Surveying of the development area, engaging with affected landowners, environmental specialist walkthroughs (where needed); » Step 2: Final design and micro-siting of the infrastructure based on geo-technical, topographical conditions and identified environmental sensitivities; » Step 3: Vegetation clearance and construction of access roads/tracks (where required); » Step 4: Construction of the BESS foundations; » Step 5: Assembly and construction of the BESS infrastructure on site; • For Lithium-ion batteries, the battery cell packs (containing an electrolyte solution) will be brought to site as sealed units which will be installed and connected on site. • For Redox-flow batteries, the battery system will be installed on site and then the electrolyte solution will be pumped into the system from mobile storage drums/totes which are temporarily brought to site to deliver the electrolyte solution. No storage facility for the storage of electrolyte solution/s outside of the battery unit will be developed on site » Step 6: Assembly and construction of MV cabling connecting the BESS to the nearby substation (overhead or underground). Erection of fencing around the BESS. » Step 7: Rehabilitation of disturbed areas; » Step 8: Continued maintenance. It is anticipated that the construction of the BESS and associated infrastructure will take up to 12 months to complete.
Activities to be undertaken	
Conduct surveys prior to construction	» Including, but not limited to: a geotechnical survey, final environmental walkthroughs (where required), site survey (including the final location of the BESS within the 500m assessed area) and confirmation of the BESS footprint, and all other associated infrastructure.

Undertake site preparation	» Including the clearance of vegetation at the BESS foundation, establishment of the laydown areas, the establishment of access roads/tracks and excavations for foundations. » Stripping of topsoil to be stockpiled, backfilled, removed from site and/or spread on site. » To be undertaken in a systematic manner to reduce the risk of exposed ground being subjected to erosion. » Include search and rescue for identified species of concern within the disturbance footprint before construction.
Establishment of laydown areas and batching plant on site	» A laydown area for the storage of BESS infrastructure components within the ~4ha BESS footprint, » If necessary, a temporary concrete batching plant of 50m x 50m in extent to facilitate the concrete requirements for BESS infrastructure foundations. Other options include the use of existing batch plants for the WEF or mobile batching plants that allow for in situ batching of concrete.
Facility installation	» Installation of BESS infrastructure within the BESS footprint. » Installation of MV cabling to connect the BESS to the nearby substation.
Undertake site rehabilitation	» Commence with rehabilitation efforts once construction is completed in an area, and all construction equipment is removed. » On commissioning, access points to the site that will not be required for the operation phase will be closed and prepared for rehabilitation.
<u>Operation Phase</u>	
Requirements	» Duration will be at least 20 years, or longer as needed for the operation of the Gunstfontein Wind Energy Facility. » Requirements for security and maintenance of the BESS infrastructure. » Employment opportunities relating mainly to operation activities and maintenance. Very limited employment opportunities will be available.
Activities to be undertaken	
Operation and Maintenance	» Ad hoc infrastructure maintenance activities. » Disposal of limited waste products in accordance with relevant waste management legislation. » On-going rehabilitation of those areas which were disturbed during the construction phase. » During this operation phase vegetation surrounding the BESS boundary will require management only if it impacts on the safety and operational objectives of the project.
<u>Decommissioning Phase</u>	
Requirements	» Decommissioning of the BESS infrastructure for the Gunstfontein Wind Energy Facility will occur at the end of its economic life. » Removal, recycling, resale or disposal of materials or components in accordance with the relevant local and/or international standards and legislation relevant at the time. » Expected lifespan of approximately 20 years (with maintenance) before decommissioning may be required. This is dependent on the lifespan of the larger Gunstfontein Wind Energy Facility. » Decommissioning activities to comply with the standards and legislation relevant at the time.
Activities to be undertaken	
Site preparation	» Confirming the integrity of access to the BESS infrastructure to accommodate the required equipment. » Mobilisation of decommissioning equipment.
Disassemble components and rehabilitation	» The BESS infrastructure components will be disassembled, removed, reused or recycled (where possible). » Where components cannot be reused or recycled it will be disposed of in accordance with the relevant standards and regulatory requirements at the time of decommissioning. » Disturbed areas, where infrastructure has been removed, will be rehabilitated, if required and depending on the future land-use of the affected areas and the relevant legislation applicable at the time of decommissioning.

It is expected that the areas affected by the BESS infrastructure will revert back to the original land-use (i.e. primarily agricultural use) once the Gunstfontein Wind Energy Facility (and by implication the proposed Gunstfontein BESS) has reached the end of its economic life and all infrastructure has been decommissioned.

2.3. Alternatives Considered during the BA Process

In accordance with the requirements of Appendix 1 of the EIA Regulations (GNR 326), 2014 (as amended) a BA Report must contain a consideration of alternatives including site (i.e. development footprint), activity, technology alternatives, as well as the "do-nothing" alternative. Alternatives are required to be assessed in terms of social, biophysical, economic and technical factors.

Most guidelines use terms such as "reasonable", "practicable", "feasible" or "viable" to define the range of alternatives that should be considered. Essentially there are two types of alternatives:

» Incrementally different (modifications) alternatives to the project.
» Fundamentally (totally) different alternatives to the project.

2.3.1 Fundamentally different alternatives

Fundamentally different alternatives are usually assessed at a strategic level, and as a result project-specific EIAs are therefore limited in their ability and scope to address fundamentally different alternatives. At a strategic level, electricity generating alternatives have been addressed as part of the Department of Energy's (DoE's) current National Integrated Resource Plan for Electricity 2010 – 2030 (IRP) , and will continue to be addressed as part of future revisions thereto. With regards to the current IRP, storage is included as part of the energy generation technologies proposed to 2030. The applicant is considering this technology as part of the Gunstfontein WEF to extend the generation capability thereof. No fundamentally different alternatives are considered feasible and therefore none are considered within this report.

2.3.2 Location Alternatives

The proposed battery energy storage system is anticipated to have a storage capacity of up to 6-8 hours, and in order to do so sufficient space is required for its footprint of up to 4ha. Various location were considered by the developer for the development of the BESS within the Gunstfontein Wind Energy Facility. Possible locations within the Gunstfontein Wind Energy Facility were considered from a land availability and environmental perspective, but as a result of environmental and technical constraints, as well as the need for the BESS to be in close proximity to the authorized WEF substation, the location alternatives were limited.

Through this process, the preferred property for the BESS was identified as Farm Gunstfontein 131. The proposed development area presents the most feasible option for the integration of the BESS and the WEF. As such, no alternative project sites were identified for the development of the BESS Facility and no alternatives are assessed within this report. However, the assessment of a 500m area around the authorised substation provides for the micro-siting of the BESS and avoidance of any areas of high environmental sensitivity during the final design.

2.3.2 Design and Layout Alternatives

A broader area of 500m around the authorised WEF substation was considered in the BA process for the placement of the BESS facility. Specialist field surveys and assessments were undertaken for this area in order to provide the developer with site specific information regarding the project site considered for the development (refer to **Appendices D-G**). Areas to be avoided by the development were identified, specifically relating to ecological features and sensitivities present within the project site. The identified

sensitivities were utilised as a tool by the developer to identify and locate the development area of the BESS facility (~4ha) within the project site, as well as to locate the development footprint/facility layout within the identified development area. This was undertaken with the aim of avoiding possible sensitive areas within the development footprint to limit impacts associated with the development.

Further aspects that influenced the layout include the proximity to the substation (i.e. an effort to reduce the MV cabling required to connect the BESS to the substation). Finally, the BESS layout aims to reduce the space requirement of the overall facility and therefore optimised components within the BESS to ensure the least amount of space is used.

The proposed layout, that can be placed anywhere in the 500m assessment area (outside of identified environmental sensitivities) in order to ensure that the development is *least intrusive* on the environment and most suitable from a technical and financial perspective. Therefore, no specific layout or design alternatives within the identified project site are being considered for the construction and operation of the BESS facility as the entire 500m area is being assessed.

2.3.3 Technology Alternatives

The general purpose and utilisation of a Battery Energy Storage System (BESS) is to save and store excess electrical output as it is generated, allowing for a timed release when the capacity is required. BESS systems therefore provide flexibility in the efficient operation of the electric grid through decoupling of the energy supply and demand. **Figure 2.3, 2.4, 2.5** and **2.6** below illustrate a typical utility scale BESS system (a Lithium-Ion BESS) as applied in the context of a Renewable Energy Facility.

Figure 2.3: Li-Ion BESS implementation for a Renewable Energy facility (Source: Enel Green Power).

Figure 2.4: Li-Ion BESS containerised modules located within the BESS enclosure footprint (Source: Enel Green Power).

Figure 2.5: Li-Ion BESS internal design and implementation of a container used within a BESS (Source: Enel Green Power).

Figure 2.6: Illustration of battery storage units installed by Tesla (Source: fastcompany.com).

As technological advances within battery energy storage systems (BESS) are frequent, no specific technology can be determined for use by the proponent at this stage. Two technology types however are envisaged, both of which have been assessed in this Basic Assessment Report to ensure all impacts related to both types have been addressed:

» Lithium-Ion technology (e.g. Lithium Ferrophosphate (LFP), Nickel Manganese Cobalt Oxide (NMC) or similar technology and chemistries); and
» Redox-flow technology (e.g. vanadium flow battery, or similar technology and chemistries).

Both technologies include batteries housed within containers which are fully enclosed and self-contained. It is important to note that while both types are detailed and assessed in this report, no specific technology is proposed as the preferred for authorisation, as both are expected to have similar impacts due to their design and functions being closely related. Therefore, the assessment proposes both technologies for authorisation (i.e. a BESS of either Lithium-Ion or Redox-flow type), to allow the proponent to determine the precise technology when the project is implemented, on the understanding that further investigation into the specific technologies available at the time of being awarded preferred bidder status will allow for one of two to be selected and ultimately developed.

These technologies are described below.

i) Lithium-Ion technology

In comparison to electrochemical coupled batteries like nickel-cadmium, a lithium-ion (Li-ion) battery is a rechargeable electrochemical battery operating on a wide array of chemistries where lithium ions are transferred between the electrodes during the charge and discharge reactions (Parsons, 2017).

A Li-ion cell is comprised of three main components; cathode and anodes electrodes, and an electrolyte that allows lithium ions to move from the negative electrode to the positive electrode during discharge and back when charging (**Figure 2.7**)(Parsons, 2017). While charging, lithium ions flow from the positive metal oxide electrode, to the negative graphite electrode which is reversed during discharge (i.e. ion flow is in the opposite direction).

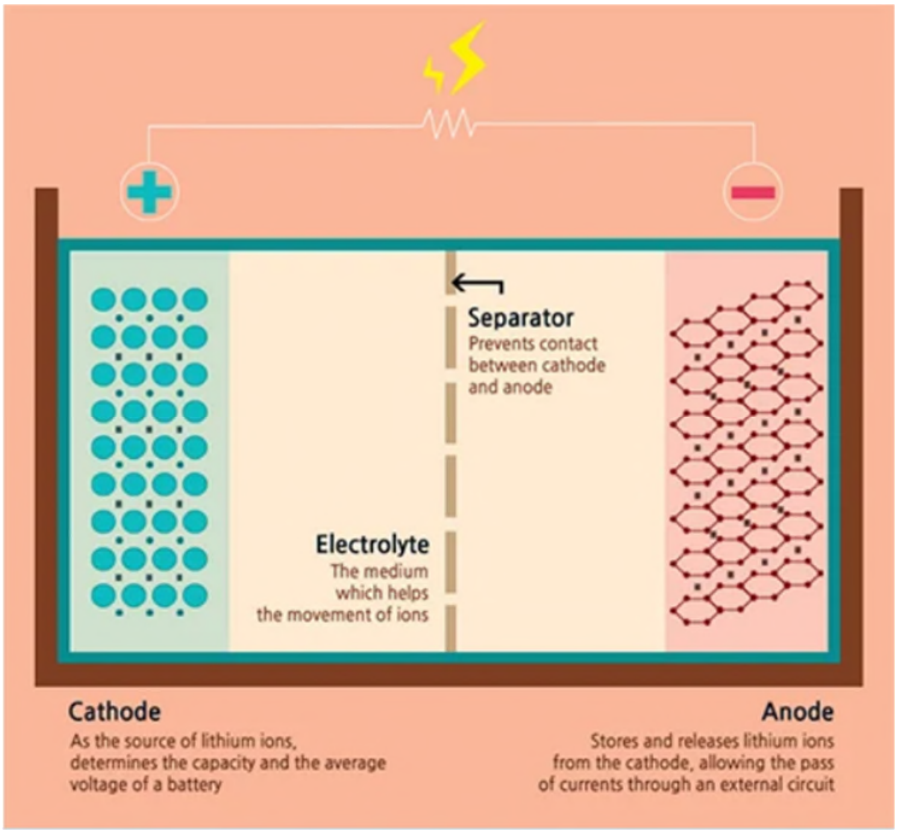

Figure 2.7: An example of a Li-ion cell and its component(Source: https://eepower.com/technical-articles/changing-the-world-with-lithium-ion-batteries/#)

Li-ion battery cells contain two reactive materials which are capable of electron transfer chemical reactions (commonly a lithium source cathode and a graphite anode). Lithium ion batteries utilise both lithium and a heavy metal (commonly cobalt or manganese) in the reactions required for energy storage. Lithium can however be recycled, adding the future potential use of this battery technology, however the recycling process is difficult and expensive.

This battery type is expected to be a dominant energy storage technology for utility-scale applications, with cycle durations up to 4 hours (Parsons, 2017). Developmental concerns related to the technology included cell monitoring and fire (due to thermal runaway, i.e. a heat positive feedback resulting in runaway heating of the unit) although fire detection, cooling and suppression systems largely address these concerns (Parsons, 2017).

The High round-trip efficiency (the fraction of energy put into the storage that can be retrieved), high power and energy density of this technology provide a significant advantage where a small footprint and available space are an issue. A significant disadvantage to Li-ion has been the high initial cost, as well as the limited cycle lives produced by earlier (historical) chemistries used in the battery (Parsons, 2017). Regardless, recent

technological advances and large-scale manufacturing have reduced the price drastically and increased performance, with the result that Li-ion batteries are expected to be an important BESS through to 2030 in both small- and large-scale applications.

ii) Flow Batteries

Flow batteries contain tanks filled with electrolyte, which flows through an electrochemical cell or reaction stack **(Figure 2.8)** (Parsons, 2017). They store and release energy through a reversible electrochemical reaction between two electrolytes (chemical reactants), which are separated by a membrane through which charging and discharging occurs. These batteries provide an energy output greater than or equal to lead acid batteries, and their storage capacity is dependent upon the size of the electrolyte tanks while the power output is dependent on the size of the reaction stack (Parsons, 2017).

Flow batteries are a technology of battery which requires mechanical systems (pumps, pipes, and tanks) and are therefore inherently more complex than a solid-state battery (for example, lithium-ion, lead or advanced lead acid batteries discussed above). The greatest advantage these batteries exhibit is their scalability and their longer duration discharge cycles which are more cost efficient when compared to solid-state batteries (Parsons, 2017). The most successful and widespread of these batteries use vanadium (discussed below) and zinc-bromine chemistries.

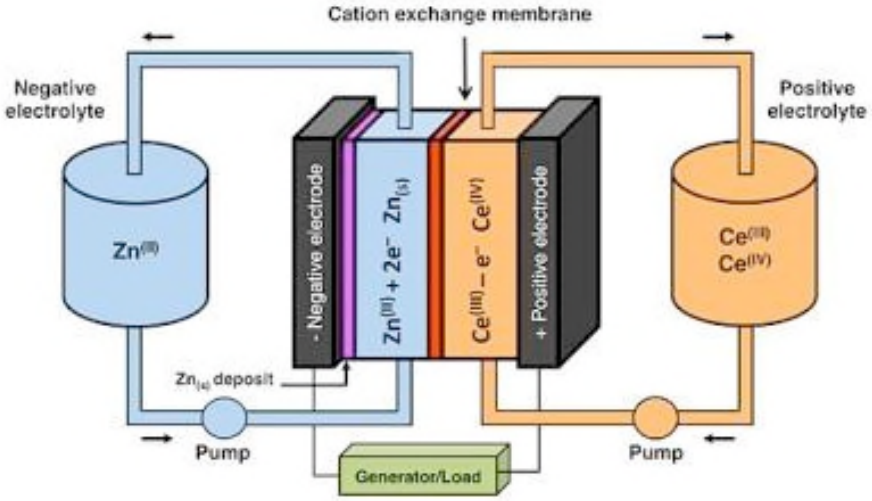

Figure 2.8: An example of a flow battery and its component
(Source:http://www.upsbatterycenter.com/blog/flow-batteries-bring-light-africa/#prettyPhoto)

Redox Flow Batteries (RFB) are a class of electrochemical energy storage technology which entail a chemical reduction and oxidation reaction that stores energy in liquid electrolyte solution flowing through a battery of electrochemical cells during charge and discharge. They are therefore a subset (or one variant) of flow batteries and essentially work by two separate containers of dissolved chemical components, separated by a membrane, which facilitate ion exchange (and thus the resulting flow of electric current) across the membrane when an electrical load is applied to the system. These batteries may act as a fuel cell, where spent electrolyte solution is exchanged once no longer effective, or rechargeable, where regeneration may be achieved by applying a source of electricity to the electrolyte). The energy capacity of this battery is a function of the volume of the electrolyte solution, allowing for a high degree of scalability.

iii) Vanadium Redox-flow technology (e.g. vanadium flow battery, or similar technology)

The use of vanadium modules within the redox-flow battery technology **(Figure 2.9)** has been shown by a few companies to have potential for significant scale-up of to the megawatt (MW) scale and discharge durations of 4 to 12+ hours (Parsons, 2017). Scaled up systems are beneficial in that they void the need for multiple, smaller redundant systems. Vanadium employed in this technology exploits the ability of vanadium solutions to exist in four different oxidation states, which allows the battery to employ only one electroactive element (vanadium solution) in various states, as opposed to an additional chemical reactant in the opposing electrolyte cell.

Vanadium is an abundant, but expensive resource in South Africa, accounting for up to 35% of the BESS' cost (Parsons, 2017). Vanadium is a nontoxic chemical, however, the electrolyte (commonly sulphuric acid) is caustic and poses corrosive and environmental hazards similar to lead-acid batteries (Parsons, 2017).

Environmental impacts and their severity are likely to be influenced by the size and scale of the system employed, as larger quantities of land may be used for electrolyte storage as compared to other systems. In addition, while the electrolytes aren't specifically toxic, other chemicals used in their implementation (for example bromine) may be and therefore containment and safe handling are needed. No significant waste products are created by their use as the storage system has the capability to indefinitely perform discharge cycles (Parsons, 2017).

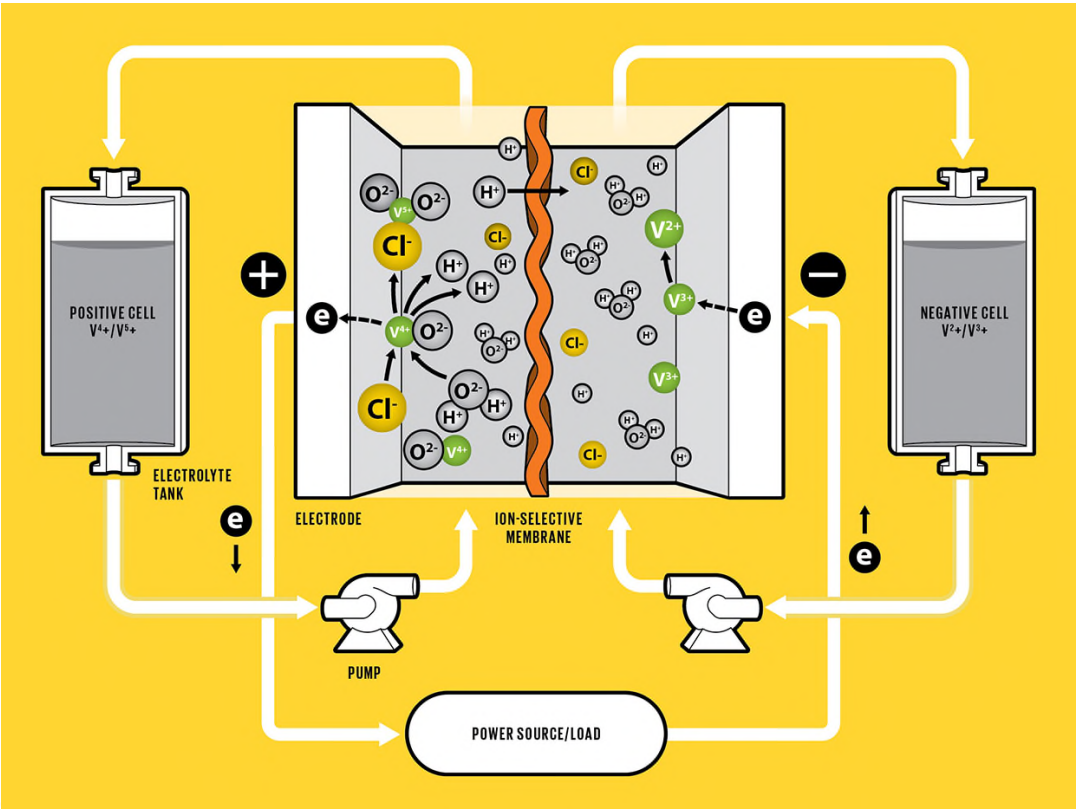

Figure 2.9: Vanadium modules within the redox-flow battery technology
(Source: https://spectrum.ieee.org/green-tech/fuel-cells/its-big-and-longlived-and-it-wont-catch-fire-the-vanadium-redoxflow-battery)

The primary advantages of vanadium redox batteries are they are highly scalable (by simply increasing the electrolyte and stack size), they can be left completely discharged for long periods without reducing their storage potential, their flow battery design type voids the capacity degradation due to single cell non-flow batteries and their electrolyte is aqueous, inherently safe and non-flammable (Wikipedia, 2020). Disadvantages include relatively poor energy-to-volume ratio in comparison with standard storage batteries, the relatively high toxicity of oxides of vanadium, the heavy nature (and thus mainly stationary application) of the electrolyte solution and their relatively poor round trip efficiency (Wikipedia, 2020).

Vanadium flow batteries will likely be a dominant long-duration discharge application in the coming 5 years, and they could dominate the long-duration market (>4 hours) over the middle to long term through 2030 (Parsons, 2017).

2.3.4 Compliance to local and international standards and Fire Prevention

The BESS will be compliant with all local laws and regulations and health and safety requirements governing battery facilities. Over and above that they will comply with international standards such as UN 38.3 (Transportation Testing for Lithium Batteries), UL 1642 (Standard for Safety – Lithium-ion Batteries) and IEC 62619 (Secondary cells and batteries containing alkaline or other non-acid electrolytes Safety requirements for secondary lithium cells and batteries, for use in industrial applications). Furthermore, the battery facility will also comply with standards such as UL 1973 (Batteries for Use in Stationary Applications) and IEC 62619-2017 including thermal runaway non-propagation and safety zone region operation limits and a failure mode analysis. The design will be compliant with UL 9540 (Energy Storage Systems and Equipment): this standard defines the safety requirements for battery installation in industrial and grid connected applications.

The design of the BESS in compliance with all the local and international standards ensures that fire risk is minimal. Furthermore, each container has a built-in fire detection and suppression system. This system continually monitors the batteries and in an unlikely event of a fire it supresses the fire using inert gas.
Each container is also spaced about 3m apart ensuring the chance of a fire spreading between containers (which are made of metal and thus not easily flammable) is also minimal.

Please refer to the figure below for a typical configuration of fire detection and suppression system.

Figure 2.10: Typical configuration of fire detection and suppression system.

2.3.5 The 'Do Nothing' Alternative

The 'do-nothing' alternative is the option of Gunstfontein Wind Farm (Pty) Ltd not constructing the BESS infrastructure. This would result in no environment or social impacts (positive or negative). This alternative is assessed in Chapter 6 of this BA Report as required in terms of the EIA regulations.

CHAPTER 3: REGULATORY AND PLANNING CONTEXT

This chapter provides insight into the policy and legislative context within which the development of the proposed BESS and associated infrastructure for the Gunstfontein Wind Energy Facility will be undertaken. It identifies environmental legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process which may be applicable to or have bearing on the proposed project.

3.1. Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report (BA)

This chapter of the BA Report includes the following information required in terms of Appendix 1: Content of Basic Assessment reports:

Requirement	Relevant Section
3(e)(i) a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report	Chapter 3 as a whole provides an overview of the policy and legislative context which is considered to be associated and relevant to the development of the Gunstfontein BESS and associated infrastructure. The regulatory and planning context has been considered at international, national, provincial and local level.
3(e)(ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools, frameworks and instruments.	Tables 3.1, 3.2, 3.3 and 3.4 illustrate the compliance of the proposed Gunstfontein BESS and associated infrastructure with the legislation, policies, plans, guidelines, tools, frameworks and instruments.

The regulatory hierarchy of policy and planning documentation that supports the development of a project of this nature consists of three tiers of authority who exercise control through both statutory and non-statutory instruments – that is National, Provincial and Local levels. These policies are discussed in more detail in the following sections, along with the provincial and local policies or plans that have relevance to the proposed development of the Gunstfontein BESS and associated infrastructure.

At **National Level**, the main regulatory agencies are:

- **Department of Environment, Forestry and Fisheries (DEFF):** This Department is responsible for environmental policy and is the controlling authority in terms of NEMA and the 2014 EIA Regulations (GN R326) as amended. DEFF is the competent authority for this project (as per GNR 779 of 01 July 2016), based on its association with the authorised Gunstfontein BESS and associated infrastructure.
- ***South African Heritage Resources Agency (SAHRA):*** SAHRA is a statutory organisation established under the National Heritage Resources Act (No. 25 of 1999) (NHRA), as the national administrative body responsible for the protection of South Africa's cultural heritage.
- ***Department of Water and Sanitation[2]:*** This Department is responsible for effective and efficient water resources management to ensure sustainable economic and social development. This Department is also responsible for evaluating and issuing licenses pertaining to water use (i.e. Water Use Licenses (WUL) and General Authorisation), where these may be applicable.

[2] The Department of Water and Sanitation (DWS) is soon to become the Department of Human Settlements, Water and Sanitation.

- ***Department of Mineral Resources and Energy (DMRE)*** This Department is responsible for granting approvals for the use of land which is contrary to the objects of the Mineral and Petroleum Resource Development Act (No. 28 of 2002) (MPRDA) in terms of Section 53 of the MPRDA. Therefore, in terms of the Act, approval from the Minister is required to ensure that the proposed activities do not sterilise mineral resource that July occur within the broader study area and development area.
- ***The Department of Agriculture, Land Reform and Rural Development (DALRRD):*** This Department is the custodian of South Africa's agricultural resources and is primarily responsible for the formulation and implementation of policies governing the agriculture sector. Furthermore, the Department is also responsible for issuing permits for the disturbance or destruction of protected tree species listed under Section 15 (1) of the National Forest Act (No. 84 of 1998) (NFA).
- ***National Energy Regulator of South Africa (NERSA):*** This body is responsible for regulating all aspects of the electricity sector and will ultimately issue licenses for IPP projects to generate electricity.

At **Provincial Level**, the main regulatory agencies are:

- ***Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform*** is a Commenting Authority for the project and is also responsible for issuing any biodiversity and conservation-related permits. The Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform's involvement relates specifically to sustainable resource management, conservation of protected species and land care.
- ***Northern Cape Department of Roads and Public Works (NCDRPW)***: NCDRPW is responsible for roads and the granting of exemption permits for the conveyance of abnormal loads on public roads.
- ***Ngwao Boswa Kapa Bokone (NBKB):*** NBKB, the Northern Cape Provincial Heritage Resources Authority is responsible for the identification, conservation and management of heritage resources, as well as commenting on heritage related issues within the Province.
- ***Northern Cape Department of Transport, Safety and Liaison:*** This Department provides effective co-ordination of crime prevention initiatives, provincial police oversight, traffic management and road safety towards a more secure environment.

At the **Local Level** the local and municipal authorities are the principal regulatory authorities responsible for planning, land use and the environment. In the Northern Cape, both the local and district municipalities play a role. The local municipality within which the Gunstfontein BESS is located is the **Karoo Hoogland Municipality**, which forms part of the **Namakwa District Municipality** (DC6). In terms of the Municipal Systems Act (Act No 32 of 2000) it is compulsory for all municipalities to go through an Integrated Development Planning (IDP) process to prepare a five-year strategic development plan for the area under their governance.

The relevant legislation and policies listed and discussed below are relevant to the Gunstfontein BESS and associated infrastructure and the Gunstfontein Wind Energy Facility. This is because the proposed Gunstfontein BESS and associated infrastructure will form an integral part of the operation of the Gunstfontein Wind Energy Facility. The Gunstfontein BESS and associated infrastructure cannot operate exclusively and requires the Gunstfontein Wind Energy Facility in order to fulfil the need for the development in its entirety.

3.3. Policy and Planning Considerations on International, National, Provincial and Local Levels

3.3.1. Policy and Planning on an International Level

South Africa has committed to various international policies which relate to environmental concerns, specifically that of climate change and global warming. **Table 3.1** below provides a summary of the international policies and plans that South Africa has made commitments towards, and how the proposed development of the Gunstfontein BESS and associated infrastructure aligns with the thinking or commitments of these agreements.

Table 3.1: International policies and plans relevant to Gunstfontein BESS and associated infrastructure

Policy or Plan	Is the development of the Gunstfontein BESS and associated infrastructure aligned with this policy or plan?
The Kyoto Protocol, 1997	Yes. The protocol calls for the reduction of South Africa's greenhouse gas emissions through actively cutting down on using fossil fuels, or by utilising more renewable resources. The development of Gunstfontein BESS and associated infrastructure will enable the storage of additional renewable energy produced by Gunstfontein Wind Energy Facility. This stored energy can later be utilised or evacuated to parts of the country and strengthen the commitment and action plan to achieve the requirements as set out in the protocol.
United Nations Framework Convention on Climate Change and COP21 – Paris Agreement	Yes. The Conference of the Parties (COP), established by Article 7 of the UNFCCC, is the supreme body and highest decision-making organ of the Convention. It reviews the implementation of the Convention and any related legal instruments and takes decisions to promote the effective implementation of the Convention. The Conference of the Parties (COP) 21 was held in Paris from 30 November to 12 December 2015. From this conference, an agreement to tackle global warming was reached between 195 countries. This Agreement is open for signature and subject to ratification, acceptance or approval by States and regional economic integration organisations that are Parties to the Convention from 22 April 2016 to 21 April 2017. Thereafter, this Agreement shall be open for accession from the day following the date on which it is closed for signature. The agreement can only be sanctioned once it has been ratified by 55 countries, representing at least 55% of emissions. South Africa signed the Agreement in April 2016 and ratified the agreement on 01 November 2016. The Agreement was assented to by the National Council of Provinces on 27 October 2016, and the National Assembly on 1 November 2016. The Agreement was promulgated on 04 November 2016, thirty days after the date on which at least 55 Parties to the Convention, which account for at least 55% of the total global greenhouse gas emissions have deposited their instruments of ratification, acceptance, approval or accession with the Depositary. Following COP21, countries met in Katowice, Poland from 2 December to 14 December 2018 for COP24. Countries agreed on various elements from COP21 held in Paris in 2015, which pertained to how governments will measure, report and verify their emission-cutting efforts, which was a key element as it ensured all countries are held to proper standards and will find it difficult to renege from the signed agreements. There was, however, a disagreement amongst countries over carbon credits which are awarded to countries for their emission-cutting efforts and their carbon sinks, such as forests, which absorb carbon. The emission count towards countries' emission-cutting

Policy or Plan	Is the development of the Gunstfontein BESS and associated infrastructure aligned with this policy or plan?
	targets. Brazil, which hoped to benefit from its large rainforest cover, insisted on a new form of wording which would allow double counting of credits, undermining the integrity of the system. This issue was put on hold and will be discussed at the COP25, to be held in Santiago de Chile, Chile. Largely absent from the COP24 discussions was the question of how countries will step up their targets on cutting emissions. On current targets, the world is set for 3° of warming from pre-industrial levels, which scientists have said would be disastrous, resulting in droughts, floods, sea level rises and the decline of agricultural productivity. South Africa's National Climate Change Response Policy (NCCRP) establishes South Africa's approach to addressing climate change, including adaptation and mitigation responses. The NCCRP formalises Government's vision for a transition to a low carbon economy, through the adoption of the 'Peak, Plateau and Decline' (PPD) GHG emissions trajectory whereby South Africa's emissions should peak between 2020 and 2025, plateau for approximately a decade, and then decline in absolute terms thereafter, and based on this the country has pledged to reduce emissions by 34% and 42% below Business As Usual (BAU) emissions in 2020 and 2025, respectively. The policy provides support for the Gunstfontein BESS and associated infrastructure which will contribute to managing climate change impacts, supporting the emergency response capacity, as well as assist in reducing GHG emissions in a sustainable manner as a result of the Gunstfontein BESS and associated infrastructure forming an integral component of the larger Gunstfontein Wind Energy Facility.
The Equator Principles III, June 2013	Yes. The Equator Principles (EPs) III constitute a financial industry benchmark used for determining, assessing, and managing a project's environmental and social risks. The EPs are primarily intended to provide a minimum standard for due diligence to support responsible risk decision-making. The EPs are applicable to large infrastructure projects and apply globally to all industry sectors. In terms of the EPs, South Africa is a non-designated country, and as such the assessment process for projects located in South Africa evaluates compliance with the applicable IFC Performance Standards on Environmental and Social Sustainability and Environmental Health and Safety (EHS) Guidelines. The Gunstfontein BESS and associated infrastructure is currently being assessed in accordance with the requirements of the 2014 EIA Regulations, as amended (GNR 326), published in terms of Section 24(5) of the National Environmental Management Act (No. 107 of 1998) (NEMA), which is South Africa's national legislation providing for the authorisation of certain controlled activities. Through this assessment, all potential social and environmental risks are identified and assessed, and appropriate mitigation measures proposed.
International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability, January 2012	Yes. The overall objectives of the IFC performance standards are to fight poverty, do no harm to people or the environment, fight climate change by promoting low carbon development, respect human rights, promote gender equality, provide information prior to project development, collaborate with the project developer in order to achieve the performance standard, provide advisory services and notify countries of trans boundary impacts. When considering the development of the Gunstfontein BESS and associated infrastructure, the following performance standards are anticipated to be applicable at this stage of the BA process: » *Performance Standard 1:* Assessment and Management of Environmental and Social Risks and Impacts » *Performance Standard 2:* Labour and Working Conditions

Policy or Plan	Is the development of the Gunstfontein BESS and associated infrastructure aligned with this policy or plan?
	» *Performance Standard 3:* Resource Efficiency and Pollution Prevention » *Performance Standard 4:* Community Health, Safety and Security » *Performance Standard 6:* Biodiversity Conservation and Sustainable Management of Living Natural Resources » *Performance Standard 8:* Cultural Heritage

3.3.2. Policy and Planning on a National Level

National policies and plans adopted by South Africa, which are considered to be relevant to the development of Gunstfontein BESS and associated infrastructure have been summarised in **Table 3.2**.

Table 3.2: National policies, plans and legislation relevant to the Gunstfontein BESS and associated infrastructure

Policy, Plan or Legislation	Is the development of the Gunstfontein BESS and associated infrastructure aligned with this policy, plan or legislation?
Constitution of the Republic of South Africa, 1996	Yes. Section 24 of the Constitution pertains specifically to the environment. It 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 prevent pollution and ecological degradation, promote conservation and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development. The Constitution outlines the need to promote social and economic development. Section 24 of the Constitution therefore requires that development be conducted in such a manner that it does not infringe on an individual's environmental rights, health, or well-being. This is especially significant for previously disadvantaged individuals who are most at risk to environmental impacts.
National Environmental Management Act (No. 107 of 1998) (NEMA)	Yes. South Africa's environmental legislation sets the framework for environmental management in South Africa. NEMA is founded on the principle that everyone has the right to an environment that is not harmful to their health or well-being as contained within the Bill of Rights. The national environmental management principles states that the social, economic and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed, evaluated, and decisions must be appropriate in the light of such consideration and assessment. The need for responsible and informed decision-making by government on the acceptability of environmental impacts is therefore enshrined within NEMA.
The National Energy Act (2008)	Yes. One of the objectives of the Act is to promote the diversity of the supply of energy and its sources. In this regard, the preamble makes direct reference to renewable resources and states that provision must be made for increased generation and consumption of renewable energies. The development of the Gunstfontein BESS and associated infrastructure enables the storage of renewable power which can later be evacuated into the national grid and thereby promotes diversity of supply of energy and the source of supply, in line with the Act's objectives.
White Paper on the Energy Policy of South Africa, 1998	Yes. The South African Energy Policy of 1998 identifies five key objectives, namely increasing access to affordable energy services, improving energy sector governance, stimulating economic development, managing energy related environmental impacts and securing

Policy, Plan or Legislation	Is the development of the Gunstfontein BESS and associated infrastructure aligned with this policy, plan or legislation?
	supply through diversity. In order to meet these objectives South Africa needs to optimally use available energy resources. The development of the Gunstfontein BESS and associated infrastructure will enable the contribution, albeit only to a limited extent, to the achievement of the five objectives of the Energy Policy of the country. These five objectives include: Increasing access to affordable energy services; Improving energy governance; Stimulating economic development; Managing energy-related environmental and health impacts and Securing supply through diversity
White Paper on the Renewable Energy Policy of the Republic of South Africa (2003)	Yes. This White Paper fosters the uptake of renewable energy in the economy and has several objectives that need to be met, including that equitable resources are invested in renewable technologies. South Africa is also endowed with renewable energy resources that can be sustainable alternatives to fossil fuels. The development of additional renewable energy projects (including Gunstfontein BESS and associated infrastructure which will form an integral part of the larger Gunstfontein Wind Energy Facility) will promote the use of the abundant South African renewable energy resources and contribute to long-term energy security and diversification of the energy mix. The development of the Gunstfontein BESS and associated infrastructure enables the storage of additional energy which can later be evacuated into the national grid and thereby enables the use of renewable energy technologies for the country over an longer period than without the BESS.
The Electricity Regulation Act, 2006 (Act No. 4 of 2006), as amended	Yes. The Act establishes a national regulatory framework for the electricity supply industry of the country and introduces the National Energy Regulator as the custodian and enforcer of the National Electricity Regulatory Framework. The Act also provides for licences and registration as the manner in which generation, transmission, distribution, trading and the import and export of electricity are regulated. The developer of the Gunstfontein BESS and associated infrastructure will have to ensure compliance with this Act for the storage and future distribution of the generated power into the national grid.
Renewable Energy Policy in South Africa	Yes. Support for the Renewable Energy Policy is guided by a rationale that South Africa has a very attractive range of renewable energy resources, particularly solar and wind, and that renewable applications are, in fact, the least cost energy service in many cases from a fuel resource perspective (i.e. the cost of fuel in generating electricity from such technology); more so when social and environmental costs are taken into account. However, the National Energy Policy acknowledges that the development and implementation of renewable energy applications has been largely neglected in South Africa. Challenges regarding the implementation of renewable energy have been identified. Through the development of renewable energy projects (including the Gunstfontein Wind Energy Facility and the Gunstfontein BESS and associated infrastructure), additional renewable energy will be made available which will assist with the further growth and development of the renewable energy sector. The development of the Gunstfontein BESS and associated infrastructure enables the storage and later evacuation of the generated power into the national grid and thereby enables further growth and development of the renewable energy sector.
National Development Plan (NDP)	Yes. The NDP aims at eliminating poverty and reducing inequality by 2030 and identifies 9 key challenges and associated remedial plans. Managing the transition towards a low carbon national economy is identified as one of the 9 key national challenges. Expansion and acceleration of commercial renewable energy is identified as a key intervention strategy. The plan also sets out steps that aim to ensure that, in 20 years, South Africa's energy system looks very different to the current situation: coal will contribute proportionately less to the primary-energy needs, while gas and renewable energy resources – especially wind, solar and imported hydroelectricity – will play a much larger

Policy, Plan or Legislation	Is the development of the Gunstfontein BESS and associated infrastructure aligned with this policy, plan or legislation?
	role. Through the development of renewable energy projects (including the Gunstfontein Wind Energy Facility and the associated Gunstfontein BESS and associated infrastructure) additional renewable energy will be available which will assist in expanding the renewable energy sector of the country and add to the diversification of the energy mix, which is moving away from coal and towards the use of gas and renewable energy.
Integrated Energy Plan (IEP)	Yes. The IEP takes into consideration the crucial role that energy plays in the entire economy of the country and is informed by the output of analyses founded on a solid fact base. Eight key objectives were identified which relate mainly to the security, cost, access, diversity, efficiency, impact in terms of emissions, conservation and social benefits in terms of energy planning. The IEP recognises the potential of renewable energy for power generation. With the additional renewable energy to be generated by Gunstfontein Wind Energy Facility, stored within the proposed Gunstfontein BESS and associated infrastructure and later evacuated to the national grid, a contribution to this objective will be made. Also, with the previously developed Gunstfontein Wind Energy Facility and the proposed Gunstfontein BESS and associated infrastructure, the eight key objectives in terms of energy planning will be met, even if only to a limited extent.
Integrated Resource Plan (IRP) 2010 - 2030	Yes. The IRP attempts to harmonize the dichotomy, especially with regard to nuclear, gas and energy storage technologies, which technologies require more consideration of future developments. The South African power system consists of the generation options, which are 38 GW installed capacity from coal, 1.8 GW from nuclear, 2.7 GW from pumped storage, 1.7 GW from hydro, 3.8 GW from diesel and 3.7 GW from renewable energy. The electricity generated is transmitted through a network of high-voltage transmission lines that connect the load centres and Eskom and municipalities distribute the electricity to various end users. Eskom also supply a number of international customers, including electricity utilities, in the SADC region. Energy security in the context of this IRP is defined as South Africa developing adequate generation capacity to meet its demand for electricity, under both the current low-growth economic environment and even when the economy turns and improves to the level of 4% growth per annum. Generation capacity must accordingly be paced to restore the necessary reserve margin and to be ahead of the economic growth curve at least possible cost, including renewable energy projects such as the Gunstfontein Wind Energy Facility. The IRP Update (2019) confirms the Government's commitment to the procurement of additional 14.4 GW of energy from wind power projects, from the present day up to 2030 Additionally the IRP Update (2019) states confirms that there is a complementary relationship between Smart Grid systems, energy storage, and non-dispatchable renewable energy technologies based on wind and solar PV. The traditional power delivery model is being disrupted by technological developments related to energy storage, and more renewable energy can be harnessed despite the reality that the timing of its production might be during low-demand periods. Storage technologies including battery systems, compressed air energy storage, flywheel energy storage, hydrogen fuel cells etc. are developments which can address this issue, especially in the South African context where over 6 GW of renewable energy has been introduced, yet the power system does not have the requisite storage capacity or flexibility.. The development of the proposed Gunstfontein BESS and associated infrastructure enables the storage or renewable energy generated by Gunstfontein Wind Energy Facility, to later

Policy, Plan or Legislation	Is the development of the Gunstfontein BESS and associated infrastructure aligned with this policy, plan or legislation?
	be evacuated into the national grid and thereby contributes to the energy mix of the country as set out in the IRP.
Strategic Integrated Projects (SIP)	Yes. In 2010, a National Development Plan was drafted to address socio-economic issues affecting development in South Africa. These issues were identified and placed under 18 different Strategic Integrated Projects (SIPs) to address the spatial imbalances of the past by addressing the needs of the poorer provinces and enabling socio-economic development. The development the Gunstfontein BESS and associated infrastructure will support the Strategic Integrated Projects within one SIP, which relates to the development of the associated infrastructure. This is known as SIP 9– electricity transmission and distribution for all. In support of SIP 9, the Department of Environmental Affairs undertook a Strategic Environmental Assessment (SEA) which aims to provide guidance for the efficient and sustainable expansion of strategic electricity grid infrastructure in South Africa. The Gunstfontein BESS and associated infrastructure is located within the Komsberg Renewable Energy Development Zone (REDZ) and is therefore considered to be aligned with national planning in this regard.
New Growth Path (NGP) Framework, 2010	Yes. The purpose of the New Growth Path (NGP) Framework is to provide effective strategies towards accelerated job-creation through the development of an equitable economy and sustained growth. The target of the NGP is to create 5 million jobs by 2020. With economic growth and employment creation as the key indicators identified in the NGP. To achieve this, government will seek to, amongst other things, identify key areas for large-scale employment creation, as a result of changes in conditions in South Africa and globally, and to develop a policy package to facilitate employment creation in these areas. The proposed Gunstfontein BESS and associated infrastructure will assist with the creation of both temporary and permanent employment opportunities during the construction and operation phases, which will contribute, albeit to a limited extent, to the economy and sustainable growth.
National Climate Change Response Strategy	Yes. This strategy aims to address issues identified as priorities for dealing with climate change in the country. The focus of the strategy is adapting to climate change; developing a sustainable energy programme; adopting an integrated response by the relevant government departments; compiling inventories of greenhouse gases; accessing and managing financial resources; and research, education, and training. The development the Gunstfontein BESS and associated infrastructure will enable additional storage and uptake of renewable energy into the national grid which will reduce the need for the use of non-renewable resources as an energy resource and thereby assist in addressing climate change and global warming.
Climate Change Bill, 2018	Yes, with limited relevance. The Bill provides a framework for climate change regulation in South Africa aimed at governing South Africa's sustainable transition to a climate resilient, low carbon economy and society. The Bill provides a procedural outline that will be developed through the creation of frameworks and plans. The bill aims to provide for the coordinated and integrated response to climate change and its impacts, provide effective management of inevitable climate change impacts and to make a fair contribution to the global effort to stabilise greenhouse gas concentrations. The Gunstfontein BESS and associated infrastructure relates only to the storage and later evacuation of renewable energy into the national grid and would therefore not result in the generation or release of emissions during its operation.

3.3.3. Policy and Planning at a Provincial Level

Policies and plans have been adopted by the Northern Cape Province for the management of the area and are considered to be relevant to the development of the Gunstfontein BESS and associated infrastructure. **Table 3.3** provides a summary of the relevant provincial plans and policies.

Table 4.3: Provincial policies and plans relevant to the Gunstfontein BESS and associated infrastructure

Policy or Plan	**Is the development of the Gunstfontein BESS and associated infrastructure aligned with this policy or plan?**
Northern Cape Provincial Spatial Development Framework (PSDF), 2012	Yes. The Northern Cape Provincial Spatial Development Framework (PSDF) 2012 states that the overarching goal for the province is to enable sustainability through sustainable development. The province considers social and economic development as imperative in order to address the most significant challenge facing the Northern Cape, which is poverty. The PSDF identifies key sectoral strategies and plans which are considered to be the key components of the PSDF. Sectoral Strategy 19 refers to a provincial renewable energy strategy. Within the PSDF a policy has been included which states that renewable energy sources (including the utilisation of solar energy) are to comprise 25% of the province's energy generation capacity by 2020. The overall energy objective for the province also includes promoting the development of renewable energy supply schemes which are considered to be strategically important for increasing the diversity of domestic energy supply and avoiding energy imports, while also minimising the detrimental environmental impacts. The implementation of sustainable renewable energy is also to be promoted within the province through appropriate financial and fiscal instruments. With the developed and proposed independent power producer capacity (including the Gunstfontein Wind Energy Facility), the Province will produce more than 100% of its own electrical power needs from renewable energy resources (although this energy will be fed into the national grid for national use). The development of the Gunstfontein BESS and associated infrastructure (through the Gunstfontein Wind Energy Facility) will enable additional storage and uptake of renewable energy into the national grid which will promote the province's objectives.
The Northern Cape Climate Change Response Strategy	Yes. The key aspects of the Northern Cape Climate Change Response Strategy (NCCCRS) Report are summarised in the MEC's (NCPG: Environment and Nature Conservation) 2011 budget speech: "*The Provincial Climate Change Response Strategy will be underpinned by specific critical sector climate change adaptation and mitigation strategies that include the Water, Agriculture and Human Health sectors as the 3 key Adaptation Sectors, the Industry and Transport alongside the Energy sector as the 3 key Mitigation Sectors with the Disaster Management, Natural Resources and Human Society, livelihoods and Services sectors as 3 remaining key. Sectors to ensure proactive long-term responses to the frequency and intensity of extreme weather events such as flooding and wildfire, with heightened requirements for effective disaster management*". Key points from the MEC address include the NCPG's commitment to develop and implement policy in accordance with the National Green Paper for the National Climate Change Response Strategy (2010), and an acknowledgement of the NCP's extreme vulnerability to climate-change driven desertification. The development and promotion of a provincial green economy, including green jobs, and environmental learnership is regarded as an important provincial intervention in addressing climate change. The renewable energy sector, including solar and wind energy (but also biofuels and energy from waste), is explicitly indicated as an important element of the Provincial Climate

Policy or Plan	Is the development of the Gunstfontein BESS and associated infrastructure aligned with this policy or plan?
	Change Response Strategy. The MEC further indicated that the NCP was involved in the processing 7 wind energy facility and 11 solar energy facility EIA applications (March 2011)[3]. The development of Gunstfontein BESS and associated infrastructure will assist in achieving (although only to a limited extent) the promotion of the provincial green economy of the Northern Cape through the storage and later evacuation of generated solar power from the Gunstfontein Wind Energy Facility.

3.3.4. Policy and Planning on a District and Local Level

Strategic policies at the district and local level have similar objectives for the respective areas, namely the delivery of basic services, including the provision of electricity. The development of the proposed Gunstfontein BESS and associated infrastructure is considered to align with the aims of these policies. **Table 3.4** below provides a summary of the district and local level policies and plans considered to be relevant to the development of the Gunstfontein BESS and associated infrastructure.

Table 3.4: District and local policies and plans relevant to the Gunstfontein BESS and associated infrastructure

Policy or Plan	Is the development of the Gunstfontein BESS and associated infrastructure aligned with this policy or plan?
Namakwa District Municipality Rural Development Plan (RDP), 2017	Yes. Renewable energy developments are considered to be development priorities within the RDP. The need to evaluate localisation possibilities for all renewable energy technologies is emphasised in the Plan. The development of renewable energy projects (including the proposed associated Gunstfontein BESS and associated infrastructure for the Gunstfontein Wind Energy Facility) will contribute to the achievement of the need for the development of renewable energy developments within the Province.
Namakwa District Municipality Integrated Development Plan (IDP), 2017 - 2022	Yes. The plan identifies the need for support to the local municipalities to deliver basic services such as water, sanitation, housing, electricity and waste management. The IDP also seeks to establish good governance by enforcing the climate change response plan. The development of the Gunstfontein BESS and associated infrastructure for the Gunstfontein Wind Energy Facility will contribute to the delivery of basic services, however only to a limited extent. The proposed Gunstfontein Wind Energy Facility and the Gunstfontein BESS and associated infrastructure will contribute to the application of the climate change response plan through zero production of greenhouse gas emissions during the operation of the facility.
Karoo Hoogland Municipality Draft Integrated Development Plan (IDP), 2018/2019	Yes. The National Development Plan, under its priority to transition to a low-carbon economy, promotes that there is a need to move away from the unsustainable use of natural resources. It warns that changes in energy generation, water conservation and the uses of both are likely to be challenging and potentially disruptive for society and that competent institutions, innovative economic instruments, clear and consistent policies and an educated and understanding electorate will be required. Key proposals to support the transition to low-carbon economy include: » Support for a carbon budgeting approach, linking social and economic considerations to carbon reduction targets » Introducing an economy-wide price for carbon complemented by a range of programmes and incentives to raise energy efficiency and manage waste better » A target of 5 million solar water heaters by 2030 » Building standards that promote energy efficiency

[3] (www.info.gov.za/speech/DynamicAction?pageid=461&sid=22143&tid=45200).

Policy or Plan	Is the development of the Gunstfontein BESS and associated infrastructure aligned with this policy or plan?
	» Simplifying the regulatory regime to encourage renewable energy, regional hydroelectric initiatives and independent power producers » Set of indicators for natural resources accompanied by publication of annual reports on health of identified resources to inform policy » Target for the amount of land and ocean under protection » Achieve the peak, plateau and decline trajectory for greenhouse gas emission with the peak being reached about 2025 » By 2030 an economy-wide carbon price should be entrenched » Zero emission building standards by 2030 » Absolute reduction in total volume of waste disposed to landfill each year » At least 20 000MW of renewable energy should be contracted by 2030 » Improved disaster preparedness for extreme climate events » Increased investment in new agricultural technologies, research and the development of adaption strategies to protect rural livelihoods and expansion of commercial agriculture

From the evidence provided in the above tables the Gunstfontein BESS aligns with several, if not, all of the policies detailed above. The Gunstfontein BESS will have a large role to play in assisting the Gunstfontein Wind Farm to achieve several policies' climate change goals, resulting in the Gunstfontein BESS being a vital component for Gunstfontein Wind Farm to play its part in assisting all policies related to climate change. The Gunstfontein BESS will also allow the storage of renewable power which can later be evacuated into the national grid and thereby promotes diversity of supply of energy and the source of supply, in line with the several objectives of the Act's detailed above and this will assist with the further growth and development of the renewable energy sector.

In conclusion the Gunstfontein BESS will assist in expanding the renewable energy sector of the country and add to the diversification of the energy mix, which is moving away from coal and towards the use of gas and renewable energy

CHAPTER 4: APPROACH TO UNDERTAKING THE BASIC ASSESSMENT PROCESS

In terms of the EIA Regulations of December 2014 (and amended) published in terms of NEMA (Act No. 107 of 1998) as amended, the construction and operation of the Gunstfontein BESS and associated infrastructure is a listed activity requiring environmental authorisation. Due to the triggering of activities within Listing Notice 1 and Listing Notice 3, of the EIA Regulations, 2014 (as amended), a BA process must be undertaken in support of the application for authorisation.

The BA process aims at identifying and describing potential environmental issues associated with the development of the Gunstfontein BESS and associated infrastructure and providing recommendations regarding appropriate mitigation measures required to be implemented.

In order to ensure that a comprehensive assessment is provided to the competent authority and I&APs regarding the impacts of the proposed infrastructure, detailed independent specialist studies were undertaken as part of the BA process. In addition, a comprehensive consultation process was conducted, and includes I&APs, the competent authority, directly impacted landowners/occupiers, relevant Organs of State departments, ward councillors and other key stakeholders. This chapter serves to outline the process that was followed during the BA process.

4.1 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report

This chapter of the BA Report includes the following information required in terms of Appendix 1: Content of the BA Report:

Requirement	Relevant Section
3(d)(i) a description of the scope of the proposed activity, including all listed and specified activities triggered and being applied for.	All listed activities triggered as a result of the development of the Gunstfontein BESS and associated infrastructure have been included in section 4.2, **Table 4.1**. The specific project activity relating to the relevant triggered listed activity has also been included in **Table 4.1**.
3(h)(ii) details of the public participation process undertaken in terms of Regulation 41 of the Regulations, including copies of the supporting documents and inputs.	The details of the public participation process undertaken for the Gunstfontein BESS and associated infrastructure have been included and described in section 4.3.2.
3(h)(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them.	A comments and responses (C&R) Report has been compiled that includes all comments raised on the Gunstfontein BESS and associated infrastructure prior to the commencement of the 30-day review period of the BA Report. The C&R Report is included as **Appendix C6**. All comments raised during the 30-day review period of the BA Report and through consultation with I&APs will be included as part of the C&R Report to be submitted as part of the final BA Report to DEFF for decision-making. The C&R Report will also include the relevant responses on the submitted comments from the relevant responding party.

Requirement	Relevant Section
3(h)(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives.	The methodology used to assess the significance of the impacts of the Gunstfontein BESS and associated infrastructure has been included in section 4.4.
(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed.	The assumptions and limitations of the BA process being undertaken for the Gunstfontein BESS and associated infrastructure is included in section 4.5.

4.2 Relevant legislative permitting requirements

4.2.1 National Environmental Management Act (No. 107 of 1998) (NEMA)

NEMA is South Africa's key piece of national environmental legislation that provides for the authorisation of certain controlled activities known as "listed activities". In terms of Section 24(1) of NEMA, the potential impact on the environment associated with listed activities must be considered, investigated, assessed and reported on to the competent authority (the decision-maker) charged by NEMA with granting of the relevant EA.

The need to comply with the requirements of the EIA Regulations published under NEMA ensures that developers are provided the opportunity to consider the potential environmental impacts of their activities early in the project development process, and also allows for an assessment to be made as to whether environmental impacts can be avoided, minimised or mitigated to acceptable levels. Comprehensive, independent environmental studies are required to be undertaken in accordance with the EIA Regulations to provide the competent authority with sufficient information for an informed decision to be taken regarding the project.

The BA process being conducted for the Gunstfontein BESS and associated infrastructure is being undertaken in accordance with Section 24 (5) of NEMA. Section 24 (5) of NEMA pertains to Environmental Authorisations (EAs), and requires that the potential consequences for, or impacts of, listed or specified activities on the environment be considered, investigated, assessed, and reported on to the competent authority. Listed Activities are activities identified in terms of Section 24 of NEMA which are likely to have a detrimental effect on the environment, and which must not commence without an EA from the competent authority subject to the completion of an environmental assessment process (either a Basic Assessment (BA) or full Scoping and EIA).

Table 4.1 details the listed activities in terms of the EIA Regulations of December 2014 (as amended) that apply to the development of the Gunstfontein BESS and associated infrastructure, and for which an Application for Environmental Authorisation has been submitted. The table also includes a description of the specific project activities that relate to the applicable listed activities.

Table 4.1: Listed activities as per the EIA regulations that are triggered by the Gunstfontein BESS and associated infrastructure

Indicate the number and date of the relevant notice:	Activity No (s) (in terms of the relevant notice):	Describe each listed activity as per the project description
GN 327, 08 December 2014 (as amended on 07 April 2017)	14	The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres. **The proposed BESS may contain electrolyte solutions considered to be a dangerous good. Although the BESS itself is not considered to be a facility for the storage of dangerous goods (rather, the function of the BESS is to store energy), the total volume of electrolyte solution used in the BESS may exceed 80m3 but will be less than 500m3. Please note that no stand-alone facilities for the storage of dangerous goods external to the BESS will be developed.**
GN 327, 08 December 2014 (as amended on 07 April 2017)	27	The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation. **Approximately 3-4 ha of indigenous vegetation will be cleared to accommodate the development of the BESS and associated facilities (such as an access road and MV cabling to connect the BESS to the WEF substation)**
GN 327, 08 December 2014 (as amended on 07 April 2017)	28	Commercial developments where such land was used for agriculture purposes on or after 01 April 1998 and where such development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; **The BESS and associated infrastructure represents an industrial development outside of an urban area, and will be in excess of 1 ha. The site proposed for the BESS is also currently utilised for agricultural purposes.**
GN 324, 08 December 2014 (as amended on 07 April 2017)	4(g)(ii)(ee)	The development of a road wider than 4 metres with a reserve less than 13,5 metres. g. Northern Cape ii. Outside urban areas: (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; **The road to the proposed BESS will be up to 6 metres in width and will be located within a Critical Biodiversity Area, with no reserve. It is anticipated that the road to the BESS will branch off from the authorised Great Karoo Wind Energy Facility access roads.**

Indicate the number and date of the relevant notice:	Activity No (s) (in terms of the relevant notice):	Describe each listed activity as per the project description
GN 324, 08 December 2014 (as amended on 07 April 2017)	10(g)(ii)(ee)	The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 30 cubic metres or more but not exceeding 80 cubic meters. g. Northern Cape iii. Outside urban areas: (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans **The proposed BESS may contain electrolyte solutions considered to be a dangerous good. Although the BESS itself is not considered to be a facility for the storage of dangerous goods (rather, the function of the BESS is to store energy), the total volume of electrolyte solution used in the BESS will exceed 30m3. Please note that no stand-alone facilities for the storage of dangerous goods external to the BESS will be developed.**
GN 324, 08 December 2014 (as amended on 07 April 2017)	12(g)(ii)	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. g. Northern Cape ii. Within critical biodiversity areas identified in bioregional plans; **Approximately 3-4 ha of vegetation will be cleared to accommodate the development of the BESS and associated facilities (such as an access road and MV cabling to connect the BESS to the WEF substation). In addition, the site is located within a Critical Biodiversity Area as indicated in the Northern Cape CBA/ESA map (Northern Cape Provincial Biodiversity Sector Plan), and more than 300m2 within that CBA area will be cleared for the construction of the BESS and associated infrastructure.**

4.2.2 National Water Act (No. 36 of 1998) (NWA)

In terms of S19, the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to prevent and remedy the effects of pollution to water resources from occurring, continuing, or recurring.

Water uses under S21 of the Act must be licensed unless such water use falls into one of the categories listed in S22 of the Act or falls under the general authorisation.
A water use license (WUL) or General Authorisation could be required in terms of Section 21 of the Act should any drainage lines on the site be impacted by the proposed project. The relevant Authority for such

applications will be the National Department of Water and Sanitation and the Northern Cape Department of Water and Sanitation.

4.2.3 National Heritage Resources Act (No. 25 of 1999) (NHRA)

The National Heritage Resources Act (No. 25 of 1999) (NHRA) provides an integrated system which allows for the management of national heritage resources and to empower civil society to conserve heritage resources for future generations. Section 38 of NHRA provides a list of activities which potentially require the undertaking of a Heritage Impact Assessment.

Section 38: Heritage Resources Management

1). Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as –

a. the construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;

b. the construction of a bridge or similar structure exceeding 50m in length;

c. any development or other activity which will change the character of a site –

i). exceeding 5 000m² in extent; or

ii). involving three or more existing erven or subdivisions thereof; or

iii). involving three or more erven or divisions thereof which have been consolidated within the past five years; or

iv). the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;

Must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

In terms of Section 38(8), approval from the heritage authority is not required if an evaluation of the impact of a development on heritage resources is required in terms of any other legislation (such as NEMA), provided that the consenting authority ensures that the evaluation of impacts fulfils the requirements of the relevant heritage resources authority in terms of Section 38(3) and any comments and recommendations of the relevant resources authority with regard to such development have been taken into account prior to the granting of the consent. As the Gunstfontein BESS and associated infrastructure exceeds *5 000m² in extent*, a Heritage Impact Assessment has been undertaken for this project (refer to **Appendix E)**. Should heritage resources of significance be affected by the Gunstfontein BESS and associated infrastructure, a permit is required to be obtained prior to disturbing or destroying such resources as per the requirements of Section 48 of the NHRA, and the SAHRA Permit Regulations (GNR 668).

4.3. Overview of the Basic Assessment Process

Key tasks undertaken for the BA include:

» Consultation with relevant decision-making and regulating authorities (at National, Provincial and Local levels).
» Submission of the completed Application for Environmental Authorisation to the competent authority (i.e. DEFF) in terms of Regulations 5 and 6 of the EIA Regulations, 2014 (GNR 326), as amended.
» Undertaking a public participation process in accordance with Chapter 6 of GNR326, and the Department of Environmental Affairs (2017), Public Participation guidelines in terms of the NEMA EIA

Regulations, Department of Environmental Affairs, Pretoria, South Africa (hereinafter referred to as "the Guidelines") in order to identify issues and concerns associated with the proposed project.
- Undertaking of independent specialist studies in accordance with Appendix 6 of the EIA Regulations, 2014 (GNR326), as amended.
- Preparation of a BA Report and EMPr in accordance with the requirements of Appendix 1 of GNR326.
- 30-day public and authority review period of the BA Report.
- Compilation of a Comments and Responses (C&R) report detailing the comments raised by I&APs prior to and during the 30-day review period of the BA Report.
- Finalisation of the BA Report and EMPr, including addressing of comments received where applicable.
- Submission of a final BA Report and EMPr to the DEFF for review and decision-making.

The tasks are discussed in detail in the sub-sections below.

4.3.1. Authority Consultation and Application for Authorisation in terms of the 2014 EIA Regulations (as amended)

Consultation with the regulating authorities (i.e. DEFF and Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform), as well as with all other relevant Organs of State, will continue throughout the BA process. To date, this consultation has included the following:

- Submission of the application for Environmental Authorisation to the DEFF.
- Submission of the BA Report and EMPr for review and comment by:
  - The competent and commenting authorities.
  - State departments that administer laws relating to a matter affecting the environment relevant to an application for Environmental Authorisation.

A record of all authority correspondence undertaken during the BA process is included in **Appendix B** and **Appendix C6** as part of the Comments and Responses Report (CRR).

An authority site visit will be undertaken should the case officer require such a visit, to be confirmed once the final Basic Assessment report has been submitted to the department for decision making.

4.3.2. Public Participation Process

Public Participation is an essential and regulatory requirement for an environmental authorisation process and is guided by Regulations 41 to 44 of the EIA Regulations 2014 (GNR 326) (as amended). The purpose of public participation is clearly outlined in Regulation 40 of the EIA Regulations 2014 (GNR 326) (as amended) and is being followed for this project.

The sharing of information forms the basis of the Public Participation Process (PPP) and offers the opportunity for I&APs to become actively involved in the BA process from the outset. The public participation process is designed to provide sufficient and accessible information to I&APs in an objective manner. The public participation process affords I&APs opportunities to provide input into and receive information regarding the BA process in the following ways:

During the BA process:
- provide an opportunity to submit comments regarding the project;

- assist in identifying reasonable and feasible alternatives;
- contribute relevant local information and knowledge to the environmental assessment;
- allow registered I&APs to verify that their comments have been recorded, considered and addressed, where applicable, in the environmental investigations;
- foster trust and co-operation;
- generate a sense of joint responsibility and ownership of the environment; and
- comment on the findings of the environmental assessments.

During the decision-making phase:

- to advise I&APs of the outcome of the competent authority's decision, and how and by when the decision can be appealed.

The public participation process therefore aims to ensure that:

- Information containing all relevant facts in respect of the application is made available to potential stakeholders and I&APs for their review.
- The information presented during the public participation process is presented in such a manner which ensures that the information is carried over to all parties in an understandable manner such that it avoids the possible alienation of the public and prevents them from participating.
- Public participation is facilitated in such a manner that I&APs are provided with a reasonable opportunity to comment on the project.
- Various ways are provided to I&APs to correspond and submit their comments i.e. fax, post, email.
- An adequate review period is provided for I&APs to comment on the findings of the BA Report.

The Public Participation Process undertaken for the proposed project considers the restrictions and limitations imposed by Government through section 27 (2) of the Disaster Management Act (Act No. 57 of 2002) of 2002 and the Directions issued by the Minister of Forestry and Fisheries (DEFF) in terms of consultations with I&APs. A Public Participation Plan was prepared and submitted to the DEFF on the 8th of July 2020. Approval of the Plan was provided by the DEFF Case Officer (Fiona Grimett) via email on **9th of July 2020** (**Appendix C7**).

Together with the standard public participation approach, additional alternative means of undertaking consultation have been designed and implemented by Savannah Environmental to ensure that I&APs are afforded sufficient opportunity to access project information and raise comments on the project through an interactive web-based platform (i.e. online stakeholder engagement platform) readily available and accessible to any person registering their interest in the project, and ensures that the public participation process is undertaken in line with Regulations 41 to 44 of the EIA Regulations, 2014 as amended. The Public Participation Plan (**Appendix C7**) considers the limitations applied by the Disaster Management Act Regulations prohibiting the gathering of people, limitations which certain I&APs may have in terms of access to computers and internet, as well as access to public spaces currently not open for operation that inhibits access to hard copy documentation. The online stakeholder engagement platform implemented by Savannah Environmental for the project allowed the EAP to visually present details regarding the project as well as consultation documentation, including project maps and plans, presentations and posters. The platform also contains the BA report available for review. The use of an online tool enables stakeholders and I&APs to explore the project-specific content in their own time, and still enables them to participate in a meaningful way in the consultation process. The online platform allows for instant feedback and comments to be submitted, in so doing saving time for the stakeholder and also giving the assurance that their comments have been submitted for inclusion in the project reporting. Where I&APs do not have access

to the online platform, information has been shared via other means such as telephone, email, WhatsApp CD and communication via the Ward Councillor and community representatives.

In terms of the requirement of Chapter 6 of the EIA Regulations of December 2014, as amended, the following key public participation tasks have been undertaken (taking into consideration the Covid-19 regulations):

- Fixing of a notice board at a place conspicuous to the public at the boundary or on the fence of—
  - (i) the site where the activity to which the application relates is or is to be undertaken; and
  - (ii) any alternative site mentioned in the application;
- Give written notice to (electronic or other means where in person contact is minimised as detailed in the "Public Participation Plan during COVID-19 Alert Level 3, Gunstfontein Battery Energy Storage System (BESS) Basic Assessment, Northern Cape Province" in **Appendix C7**):
  - (i) the owner or person in control of that land if the applicant is not the owner or person in control of the land;
  - (ii) the occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  - (iii) owners and occupiers of land adjacent to the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  - (iv) the municipal councillor of the ward in which the site or alternative site is situated and any organisation of ratepayers that represent the community in the area;
  - (v) the municipality which has jurisdiction in the area;
  - (vi) any organ of state having jurisdiction in respect of any aspect of the activity; and
  - (vii) any other party as required by the competent authority.
- Place an advertisement in one local newspaper.
- Open and maintain a register of I&APs and Organs of State.
- Prepare a Comments and Responses (C&R) Report which documents the comments received on the BA process and the responses provided by the project team prior to the release of the BA Report for a 30-day review period.
- Release a BA Report for a 30-day review period, including the notification of I&APs of the availability and review thereof.
- Update the C&R Report with all comments raised during the 30-day review period for submission with the final BA Report.

In compliance with the requirements of Chapter 6: Public Participation of the EIA Regulations, 2014 (as amended), the following summarises the key public participation activities conducted to date.

i. Stakeholder identification and Register of Interested and Affected Parties

42. A proponent or applicant must ensure the opening and maintenance of a register of I&APs and submit such a register to the competent authority, which register must contain the names, contact details and addresses of –
    (a) All persons who, as a consequence of the public participation process conducted in respect of that application, have submitted written comments or attended meetings with the proponent, applicant or EAP;
    (b) All persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and
    (c) All organs of state which have jurisdiction in respect of the activity to which the application relates.

I&APs have been identified through a process of networking and referral, obtaining information from Savannah Environmental's existing stakeholder database, liaison with potentially affected parties in the greater study area and a registration process involving the completion of a reply form. Key stakeholders and affected landowners have been identified and registered on the project database. Other stakeholders and/or I&APs are required to formally register their interest in the project. An initial list of key stakeholders identified and registered is listed in **Table 4.2**.

Table 4.2: List of Stakeholders identified for the inclusion in the project database during the public participation process for the Gunstfontein BESS and associated infrastructure

Organs of State
National Government Departments
Department of Environment, Forestry and Fisheries (DEFF)
Department of Agriculture, Land Reform and Rural Development (DALRRD)
Department of Local Government and Traditional Affairs
Department of Mineral Resources
Department of Water and Sanitation (Catchment Management Agencies)
Department of Science and Technology
Government Bodies / State-Owned Companies / State-Owned Enterprices
Eskom Holdings SOC Limited
National Energy Regulator of South Africa (NERSA)
Department of Science and Technology (incl Astronomy Management Authority)
South African Heritage Resource Agency
Provincial Government Departments
Northern Cape Department of Agriculture
Northern Cape Department of Agriculture, Environmental Affairs, Rural development and Land Reform
Department of Roads and Public Works
Department of Water and Sanitation
Department of Rural Development and Land Reform
Local Government Departments
Namakwa District Municipality
Karoo Hoogland Local Municipality
Key Stakeholders
Endangered Wildlife Trust
South African National Roads Agency LTD (SANRAL)
South African Astronomy Observatory (SARAO)
Aviation Authorities
SENTEC
Agricultural Associations
Nature Reserves
Birdlife SA

Landowners
Affected landowners, tenants and occupiers of land

As per Regulation 42 of the EIA Regulations, 2014 (as amended), all relevant stakeholder and I&AP information has been recorded within a register of I&APs (refer to **Appendix C1** for a listing of the recorded parties). In addition to the above-mentioned EIA Regulations, point 4.1 of the Public Participation Guidelines has also been followed. The register of I&APs contains the names, contact details and addresses of:

- all persons who requested to be registered on the database in writing and disclosed their interest in the project;
- all Organs of State which hold jurisdiction in respect of the activity to which the application relates;
- all persons identified and approached through networking or a chain referral system to identify any other stakeholder (i.e. ratepayers associations); and
- all persons who submitted written comments or attended meetings during the public participation process.

I&APs have been encouraged to register their interest in the BA process from the onset of the project, and the identification and registration of I&APs will be on-going for the duration of the BA process. The database of I&APs will be updated throughout the BA process and will act as a record of the I&APs involved in the public participation process.

ii. Advertisements and Notifications

40.(2)(a)	Fixing a notice board at a place conspicuous to and accessible by the public at the boundary, on the fence or along the corridor of – (i) The site where the activity to which the application or proposed application relates is or is to be undertaken; and (ii) Any alternative site.
40.(2)(b)	Giving written notice, in any of the manners provided for in section 47D of the Act, to – (i) The occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken; (ii) Owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken; (iii) The municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area; (iv) The municipality which has jurisdiction in the area; (v) Any organ of state having jurisdiction in respect of any aspect of the activity; and (vi) Any other party as required by the competent authority.
40.(2)(c)	Placing an advertisement in – (i) One local newspaper; or (ii) Any official Gazette that is published specifically for the purpose of providing public notice of applications or other submissions made in terms of these Regulations;
40.(2)(d)	Placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or July have an impact that extends beyond the boundaries of the metropolitan or district municipality in which it is or will be undertaken: Provided that this paragraph need not be complied with if an advertisement has been placed in an official Gazette referred to in paragraph (c)(ii); and
40.(2)(e)	Using reasonable alternative methods, as agreed to by the competent authority, in those instances where a person is desirous of but unable to participate in the process due to –

(i) Illiteracy;
(ii) Disability; or
(iii) Any other disadvantage.

The BA process was announced with an invitation to the Organs of State, potentially affected landowners and general public to register as I&APs and to actively participate in the process. This was achieved via the following:

- Placement of site notices regarding the BA process at visible points along the fence of affected property, in accordance with the requirements of the EIA Regulations, on 7 August 2020. Photographs and the GPS co-ordinates of the site notices are contained in **Appendix C2**.
- Placement of advertisement announcing the BA process and the availability of and inviting comment on the BA Report in the Noordwester local newspaper on 14 October 2020 at the commencement of the 30-day review period. This advert also included the details on the review period for the BA report and the location of where the report can be accessed. The details of the newspaper advert placement will be contained in **Appendix C2** of the final BA Report.
- The BA Report has been made available for review by I&APs for a 30-day review period from **16 October 2020 to 16 November 2020**. Electronic copies of the BA Report have been circulated to certain Organs of State via online platforms at the commencement of the review period. The BA Report for the project has been compiled and is available for download, review and comment on the Savannah Environmental website: https://www.savannahsa.com/public-documents/energy-generation/. In accordance with the directions to minimise risks associated with COVID-19, hard copies of the report will only be provided where sanitary conditions can be assured.
- The evidence of distribution of the BA Report will be included in the final BA Report, which will be submitted to the DEFF.

iii. Public Involvement and Consultation

In order to accommodate the varying needs of stakeholders and I&APs within the greater study area, as well as capture their views, comments, issues and concerns regarding the project, various opportunities have been and will continue to be provided to I&APs to note their comments and issues. I&APs are being consulted through the following means:

Table 4.3: Consultation undertaken for the Gunstfontein BESS and associated infrastructure

Activity	Date
Distribution of the process notification and stakeholder reply form announcing the BA process and inviting I&APs to register on the project database.	7 August 2020
Placement of site notices and process notices on-site and in public places (including garages, local police stations etc)	7 August 2020
Distribution of notification letters announcing the availability of the BA Report for review for a 30-day review and comment period. These letters were distributed to Organs of State, Government Departments, Ward Councillors, landowners within the greater study area and key stakeholder groups.	16 October 2020
Advertising of the availability of the BA Report for a 30-day review period in a local newspaper.	14 October 2020

Activity	Date
30-day review period of the BA Report	16 October 2020 to 16 November 2020
On-going consultation (i.e. telephone liaison; e-mail communication) with all I&APs	Throughout BA process

The purpose of the abovementioned engagements with key stakeholders was to ensure that all comments are noted and addressed as part of the BA process and included as part of the BA Report. Records of all consultation undertaken are included in **Appendix C**.

iv. Registered I&APs entitled to Comment on the BA Report and Plans

43.(1) A registered I&AP is entitled to comment, in writing, on all reports or plans submitted to such party during the public participation process contemplated in these Regulations and to bring to the attention of the proponent or applicant any issues which they believe will be of significance to the consideration of the application, provided that the interested and affected party discloses any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application.

(2) In order to give effect to section 24O of the Act, any State department that administers a law relating to a matter affecting the environment must be requested, subject to regulation 7(2), to comment within 30 days.

44.(1) The applicant must ensure that the comments of interested and affected parties are recorded in reports and plans and that such written comments, including responses to such comments and records of meetings, are attached to the reports and plans that are submitted to the competent authority in terms of these Regulations.

(2) Where a person desires but is unable to access written comments as contemplated in subregulation (1) due to –

(a) A lack of skills to read or write;
(b) Disability; or
(c) Any other disadvantage;

Reasonable alternative methods of recording comments must be provided for.

I&APs registered on the database have been notified by means of a notification letter (e-mail) of the release of the BA Report for a 30-day review period, invited to provide comment on the BA Report, and informed of the manner in which, and timeframe within which such comment must be made. The notification was distributed prior to commencement of the 30-day review period, on 7th August 2020.

v. Identification and Recording of Comments

Comments raised by I&APs over the duration of the BA process have been synthesised into a C&R Report which is included in **Appendix C6**of the BA Report. The C&R Report includes detailed responses from members of the EIA project team and/or the project proponent to the issues and comments raised prior to the release of the 30-day review period. The C&R Report will be updated with all comments received during the 30-day review period and will be included as **Appendix C6** in the final BA Report that will be submitted to the DEFF for decision-making.

4.4. DEFF Screening Tool Results

In terms of GN R960 (promulgated on 5 July 2019) and Regulation 16(1)(b)(v) of the 2014 EIA Regulations (as amended), the submission of a Screening Report generated from the national web based environmental screening tool is compulsory for the submission of applications in terms of Regulation 19 and 21 of the 2014 EIA Regulations.

The requirement for the submission of a Screening Report for the proposed development is applicable as it triggers Regulation 19 of the 2014 EIA Regulations (as amended). The below tables provides a summary of the specialist assessment requirements identified for the project site in terms of the screening tool (based on the identified 500m assessment zone surrounding the Gunstfontein Substation) (refer to **Appendix L** for the report) and responses to each assessment requirement based on the nature and extent of the project.

Table 4.4: A summary of the proposed specialist studies and sensitivity ratings as per the online tool.

No.	Specialist Assessment	Sensitivity rating as per the online tool	Comment
1	Landscape/Visual Impact Assessment	None specified	The proposed Gunstfontein BESS and associated infrastructure will be entirely contained within the footprint of the authorised Gunstfontein WEF. In addition, the Gunstfontein BESS and associated infrastructure will be located as close as possible from the already authorised Gunstfontein Substation, within the Gunstfontein Wind Energy Facility. The development of the Gunstfontein BESS and associated infrastructure within the bounds of the Gunstfontein Wind Energy Facility will not result in any additional visual impact not already experienced by virtue of the Gunstfontein Wind Energy Facility and its associated infrastructure. No visual impact assessment was therefore conducted for this Basic Assessment.
2	Archaeological and Cultural Heritage Impact Assessment	Medium sensitivity	As the study area has been thoroughly assessed previously (as part of the original WEF EIA), a desktop heritage screening assessment was deemed sufficient for the project. A heritage screener report, from Cedar Tower Services has been included into this Basic Assessment, to address the archaeological and cultural impact, as well as the palaeontology impact anticipated from the proposed development.
3	Palaeontology Impact Assessment	High sensitivity	
4	Terrestrial Biodiversity Impact Assessment	Very high sensitivity	An Ecological assessment (flora, fauna and surface water) has been included for this Basic Assessment, in order to address any terrestrial biodiversity impact anticipated.
5	Aquatic Biodiversity Impact Assessment	Very high sensitivity	Owing to the small footprint of the BESS, the 500m assessment zone considered around the associated substation and the dry nature of this area (i.e. the relative scarcity of water features within the landscape) allow for the carefully selected placement of the BESS to not impact on the water sources potentially occurring within and/or surrounding the project site. In addition, no aquatic or hydrological biodiversity impact assessment was therefore conducted for this Basic Assessment. However the terrestrial biodiversity assessment did consider surface water features.
6	Hydrology Assessment	Low sensitivity	
7	Socio-Economic Assessment	None specified	The Gunstfontein BESS and associated infrastructure will be entirely contained within the authorised Gunstfontein WEF. The development of the BESS within the bounds of this Gunstfontein Wind Energy Facility will not incur any additional socio-economic impacts not already associated with the Gunstfontein Wind Energy Facility development.

No.	Specialist Assessment	Sensitivity rating as per the online tool	Comment
			No socio-economic impact assessment was therefore conducted for this Basic Assessment

4.5. Assessment of Impacts Identified through the BA Process

Based on the outcomes of the above considerations from the Screening Report, the following specialist studies have been undertaken as part of this BA process.

Table 4.5: Specialist studies undertaken as part of the BA process

Specialist Name	Specialist Company	Specialist Area of Expertise	Appendices
Simon Todd	3Foxes Biodiversity Consulting (Pty) Ltd	Ecology (terrestrial biodiversity)	Appendix D
Jenna Lavin	CTS Heritage (Pty) Ltd	Heritage (including archaeology and palaeontology)	Appendix E
Morné de Jager	EARES Enviro Acoustic Research	Noise (Compliance Statement)	Appendix F
Mariné Pienaar	TerraAfrica	Agricultural Potential (Compliance Statement)	Appendix G

Specialist studies considered direct and indirect environmental impacts associated with the development of all components of the BESS and associated infrastructure. Impacts were assessed in terms of the following criteria:

- The **nature**, a description of what causes the effect, what will be affected, and how it will be affected;
- The **extent**, wherein it is indicated whether the impact will be local (limited to the immediate area or site of development), regional, national or international. A score of between 1 and 5 is assigned as appropriate (with a score of 1 being low and a score of 5 being high);
- The **duration**, wherein it is indicated whether:
  - The lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
  - The lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
  - Medium-term (5–15 years) – assigned a score of 3;
  - Long term (> 15 years) - assigned a score of 4;
  - Permanent - assigned a score of 5.
- The **magnitude**, quantified on a scale from 0-10, where a score is assigned:
  - 0 is small and will have no effect on the environment;
  - 2 is minor and will not result in an impact on processes;
  - 4 is low and will cause a slight impact on processes;
  - 6 is moderate and will result in processes continuing but in a modified way;
  - 8 is high (processes are altered to the extent that they temporarily cease);
  - 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The **probability of occurrence**, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale, and a score assigned:
  - Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
  - Assigned a score of 2 is improbable (some possibility, but low likelihood);
  - Assigned a score of 3 is probable (distinct possibility);

- Assigned a score of 4 is highly probable (most likely);
- Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).

» The **significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high;
» The **status**, which is described as either positive, negative or neutral;
» The degree to which the impact can be reversed;
» The degree to which the impact July cause irreplaceable loss of resources;
» The degree to which the impact can be mitigated.

The **significance** is determined by combining the criteria in the following formula:

S = (E+D+M) P; where

S = Significance weighting.
E = Extent.
D = Duration.
M = Magnitude.
P = Probability.

The **significance weightings** for each potential impact are as follows:

» **< 30 points:** Low (i.e. where this impact would not have a direct influence on the decision to develop in the area);
» **30-60 points:** Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated);
» **> 60 points:** High (i.e. where the impact must have an influence on the decision process to develop in the area).

As the proponent has the responsibility to avoid or minimise impacts and plan for their management (in terms of the EIA Regulations, 2014 (as amended)), the mitigation of significant impacts is discussed. Assessment of impacts with mitigation is made in order to demonstrate the effectiveness of the proposed mitigation measures.

4.6. Assumptions and Limitations of the BA Process

The following assumptions and limitations are applicable to the studies undertaken within this BA process:

» All information provided by the developer and I&APs to the environmental team was correct and valid at the time it was provided.
» It is assumed that the BESS identified by the developer represents a technically suitable solution for the storage of generated power associated with the Gunstfontein Wind Energy Facility.
» This report and its investigations are project-specific, and consequently the environmental team did not evaluate any other BESS technology alternatives.

Refer to the specialist studies in **Appendices D-G** for specialist study specific limitations.

4.7. Legislation and Guidelines that have informed the preparation of this Basic Assessment Report

The following legislation and guidelines have informed the scope and content of this BA Report:

- National Environmental Management Act (Act No. 107 of 1998).
- EIA Regulations of December 2014, published under Chapter 5 of NEMA (as amended).
- Department of Environmental Affairs (2017), Public Participation guidelines in terms of NEMA EIA Regulations.
- International guidelines – the Equator Principles, the IFC Performance Standards, the Sustainable Development Goals, World Bank Environmental and Social Framework, and the and World Bank Group Environmental, Health, and Safety Guidelines (EHS Guidelines).

Relevant legislation and permitting requirements applicable to the BESS and associated infrastructure are summarised in Table 4.6.

Table 4.6: Applicable Legislation, Policies and/or Guidelines associated with the development of the BESS and associated Infrastructure

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
National Legislation			
Constitution of the Republic of South Africa (No. 108 of 1996)	In terms of Section 24, the State has an obligation to give effect to the environmental right. The environmental right 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:* ∗ *Prevent pollution and ecological degradation,* ∗ *Promote conservation, and* ∗ *Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development*."	Applicable to all authorities	There are no permitting requirements associated with this Act. The application of the Environmental Right however implies that environmental impacts associated with proposed development are considered separately and cumulatively. It is also important to note that the "right to an environment" clause includes the notion that justifiable economic and social development should be promoted, through the use of natural resources and ecologically sustainable development.
National Environmental Management Act (No 107 of 1998) (NEMA)	The 2014 EIA Regulations have been promulgated in terms of Chapter 5 of NEMA. Listed activities which July not commence without EA are identified within the Listing Notices (GNR 327, GNR 325 and GNR 324) which form part of these Regulations (GNR 326). In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these listed activities must be assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation. A Basic Assessment Process is required to be undertaken for the proposed project.	DEFF – Competent Authority Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform – Commenting Authority	The listed activities triggered by the proposed project have been identified and are assessed within the BA process for the BESS and associated infrastructure. The BA process will culminate in the submission of a final BA Report to the competent authority in support of the Application for Environmental Authorisation.
National Environmental Management Act (No 107 of 1998) (NEMA)	In terms of the "Duty of Care and Remediation of Environmental Damage" provision in Section 28(1) of NEMA every person who causes, has caused or July	DEFF	While no permitting or licensing requirements arise directly by virtue of the proposed BESS and associated

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment. In terms of NEMA, it is the legal duty of a project proponent to consider a project holistically, and to consider the cumulative effect of a variety of impacts.	Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform	infrastructure, this section finds application through the consideration of potential cumulative, direct, and indirect impacts.
Environment Conservation Act (No. 73 of 1989) (ECA)	The Noise Control Regulations in terms of Section 25 of the ECA contain regulations applicable for the control of noise in the Provinces of Limpopo, North West, Mpumalanga, Northern Cape, Eastern Cape, and KwaZulu-Natal Provinces. The Noise Control Regulations cover the powers of a local authority, general prohibitions, prohibitions of disturbing noise, prohibitions of noise nuisance, use of measuring instruments, exemptions, attachments, and penalties. In terms of the Noise Control Regulations, no person shall make, produce or cause a disturbing noise, or allow it to be made, produced or caused by any person, machine, device or apparatus or any combination thereof (Regulation 04).	DEFF Northern Cape Department of Agriculture, Environmental Affairs, Rural development and Land Reform Karoo Hoogland Local Municipality	Minor construction noise is associated with the construction phase of the project. Considering the location of the BESS and associated infrastructure in relation to residential areas and provided that appropriate mitigation measures are implemented, construction noise is unlikely to present a significant intrusion to the local community. Additionally, a noise compliance statement conducted by a noise specialist indicated noise impact of a low significance on all potential Noise-Sensitive Developments (NSD).
Minerals and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA)	In accordance with the provisions of the MPRDA a mining permit is required in accordance with Section 27(6) of the Act where a mineral in question is to be mined, including the mining of materials from a borrow pit.	DMRE	Any person who wishes to apply for a mining permit in accordance with Section 27(6) must simultaneously apply for an Environmental Authorisation in terms of NEMA. No borrow pits are expected to be required for the construction of the BESS and associated infrastructure, and as a result a

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
			mining permit or EA is not required to be obtained.
	Section 53 of the MPRDA states that any person who intends to use the surface of any land in any way which July be contrary to any object of the Act, or which is likely to impede any such object must apply to the Minister for approval in the prescribed manner.		In terms of Section 53 of the MPRDA, approval is required from the Minister of Mineral Resources to ensure that the proposed BESS and associated infrastructure does not sterilise a mineral resource that might be present within the project site.
National Environmental Management: Air Quality Act (No. 39 of 2004) (NEM:AQA)	The National Dust Control Regulations (GNR 827) published under Section 32 of NEM:AQA prescribe the general measures for the control of dust in all areas, and provide a standard for acceptable dustfall rates for residential and non-residential areas. In accordance with the Regulations (GNR 827) any person who conducts any activity in such a way as to give rise to dust in quantities and concentrations that July exceed the dustfall standard set out in Regulation 03 must, upon receipt of a notice from the air quality officer, implement a dustfall monitoring programme. Any person who has exceeded the dustfall standard set out in Regulation 03 must, within three months after submission of the dustfall monitoring report, develop and submit a dust management plan to the air quality officer for approval.	Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform Namakwa District Municipality (DC6)	In the event that the construction of the BESS and associated infrastructure results in the generation of excessive levels of dust, the possibility could exist that a dustfall monitoring programme would be required for the project, in which case dustfall monitoring results from the dustfall monitoring programme would need to be included in a dust monitoring report, and a dust management plan would need to be developed. However, with mitigation measures implemented, construction of the BESS and associated infrastructure is not anticipated to result in significant dust generation or the requirement of a dust monitoring programme.
National Heritage Resources Act (No. 25 of 1999) (NHRA)	Section 07 of the NHRA stipulates assessment criteria and categories of heritage resources according to their significance. Section 35 of the NHRA provides for the protection of all archaeological and palaeontological sites, and meteorites.	South African Heritage Resources Agency Ngwao Boswa Kapa Bokone (NBKB)	A Desktop Heritage Impact Assessment (HIA) has been undertaken as part of the BA process (refer to **Appendix E** of this BA Report). The HIA considers impacts on both archaeology, heritage and palaeontology. Based on the information available from heritage assessments previously conducted

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	Section 36 of the NHRA provides for the conservation and care of cemeteries and graves by SAHRA where this is not the responsibility of any other authority. Section 38 of the NHRA lists activities which require developers or any person who intends to undertake a listed activity to notify the responsible heritage resources authority and furnish it with details regarding the location, nature, and extent of the proposed development. Section 44 of the NHRA requires the compilation of a Conservation Management Plan as well as a permit from SAHRA for the presentation of archaeological sites as part of tourism attraction.		in the area proposed for development, the proposed development of the BESS within the Gunstfontein WEF is unlikely to negatively impact on significant archaeological, built environment and palaeontological heritage as long as the recommendations from the previous studies are implemented. From a heritage perspective, the proposed BESS can be located anywhere within the 500m area assessed in this screening assessment. Should a heritage resource be impacted upon, a permit may be required from SAHRA or Ngwao Boswa Kapa Bokone (NBKB) in accordance with Section 48 of the NHRA, and the SAHRA Permit Regulations (GNR 668).
National Environmental Management: Biodiversity Act (No. 10 of 2004) (NEM:BA)	Section 53 of NEM:BA provides for the MEC / Minister to identify any process or activity in such a listed ecosystem as a threatening process. Three government notices have been published in terms of Section 56(1) of NEM:BA as follows: » Commencement of TOPS Regulations, 2007 (GNR 150). » Lists of critically endangered, vulnerable and protected species (GNR 151). » TOPS Regulations (GNR 152). It provides for listing threatened or protected ecosystems, in one of four categories: critically endangered (CR), endangered (EN), and vulnerable (VU) or protected. The	DEFF Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform	Under NEM:BA, a permit would be required for any activity that is of a nature that may negatively impact on the survival of a listed protected species. Please refer to the Ecological Impact Assessment (**Appendix D)** for further details on all required permits. A pre-construction walk-through of the site is required in order to determine the precise species and location for the permit application.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	first national list of threatened terrestrial ecosystems has been gazetted, together with supporting information on the listing process including the purpose and rationale for listing ecosystems, the criteria used to identify listed ecosystems, the implications of listing ecosystems, and summary statistics and national maps of listed ecosystems (NEM:BA: National list of ecosystems that are threatened and in need of protection, (Government Gazette 37596, GNR 324), 29 April 2014).		
National Environmental Management: Biodiversity Act (No. 10 of 2004) (NEM:BA)	Chapter 5 of NEM:BA pertains to alien and invasive species, and states that a person July not carry out a restricted activity involving a specimen of an alien species without a permit issued in terms of Chapter 7 of NEM:BA, and that a permit July only be issued after a prescribed assessment of risks and potential impacts on biodiversity is carried out. Applicable, and exempted alien and invasive species are contained within the Alien and Invasive Species List (GNR 864).	DEFF Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform	Restricted Activities and the respective requirements applicable to persons in control of different categories of listed invasive species are contained within the Alien and Invasive Species Regulations (GNR 598) published under NEM:BA, together with the requirements of the Risk Assessment to be undertaken. Please refer to the Ecological Impact Assessment (**Appendix D)** for further details. The EMPr **(Appendix H)** does make provision for mitigation measures for alien vegetation present within the BESS footprint.
Conservation of Agricultural Resources Act (No. 43 of 1983) (CARA)	Section 05 of CARA provides for the prohibition of the spreading of weeds. Regulation 15 of GNR 1048 published under CARA provides for the classification of categories of weeds and invader plants, and restrictions in terms of where these species July occur. Regulation 15E of GNR 1048 published under CARA provides requirement and methods to implement control	Department of Agriculture, Land Reform and Rural Development	CARA will find application throughout the life cycle of the project. In this regard, soil erosion prevention and soil conservation strategies need to be developed and implemented. In addition, weed control and management measures must be included into the EMPr.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	measures for different categories of alien and invasive plant species.		
National Veld and Forest Fire Act (No. 101 of 1998) (NVFFA)	Chapter 4 of the NVFFA places a duty on owners to prepare and maintain firebreaks, the procedure in this regard, and the role of adjoining owners and the fire protection association. Provision is also made for the making of firebreaks on the international boundary of the Republic of South Africa. The applicant must ensure that firebreaks are wide and long enough to have a reasonable chance of preventing a veldfire from spreading to or from neighbouring land, it does not cause soil erosion, and it is reasonably free of inflammable material capable of carrying a veldfire across it. Chapter 5 of the Act places a duty on all owners to acquire equipment and have available personnel to fight fires. Every owner on whose land a veldfire July start or burn or from whose land it July spread must have such equipment, protective clothing and trained personnel for extinguishing fires, and ensure that in his or her absence responsible persons are present on or near his or her land who, in the event of fire, will extinguish the fire or assist in doing so, and take all reasonable steps to alert the owners of adjoining land and the relevant fire protection association, if any.	DEFF	While no permitting or licensing requirements arise from this legislation, this Act will be applicable during the construction and operation of the BESS and associated infrastructure, in terms of the preparation and maintenance of firebreaks (if/as applicable), and the need to provide appropriate equipment and personnel for firefighting purposes.
Hazardous Substances Act (No. 15 of 1973) (HAS)	This Act regulates the control of substances that July cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly sensitising or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger, to provide for the prohibition and control of the importation,	Department of Health	It is necessary to identify and list all Group I, II, III, and IV hazardous substances that may present with the development of the BESS and associated infrastructure and in what operational context they are used, stored or handled. If applicable, a license would be required to be obtained from the Department of Health.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	manufacture, sale, use, operation, modification, disposal or dumping of such substances and products. » Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc., nature or because it generates pressure through decomposition, heat or other means, cause extreme risk of injury etc., can be declared as Group I or Group II substance » Group IV: any electronic product, and » Group V: any radioactive material. The use, conveyance, or storage of any hazardous substance (such as distillate fuel) is prohibited without an appropriate license being in force.		
National Environmental Management: Waste Act (No. 59 of 2008) (NEM:WA)	The Minister July by notice in the Gazette publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment. The Minister July amend the list by – » Adding other waste management activities to the list. » Removing waste management activities from the list. » Making other changes to the particulars on the list. In terms of the Regulations published in terms of NEM:WA (GNR 912), a BA or EIA is required to be undertaken for identified listed activities. Any person who stores waste must at least take steps, unless otherwise provided by this Act, to ensure that: » The containers in which any waste is stored, are intact and not corroded or in	DEFF – Hazardous Waste Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform – general waste	No listed waste activities are triggered by the BESS and associated infrastructure and therefore no Waste Management License is required to be obtained. General and hazardous waste handling, storage and disposal will be required during construction and operation of the BESS and associated infrastructure. The National Norms and Standards for the Storage of Waste (GNR 926) published under Section 7(1)(c) of NEM:WA will need to be considered in this regard, if applicable.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	» Any other way rendered unlit for the safe storage of waste. » Adequate measures are taken to prevent accidental spillage or leaking. » The waste cannot be blown away. » Nuisances such as odour, visual impacts and breeding of vectors do not arise, and » Pollution of the environment and harm to health are prevented.		
National Road Traffic Act (No. 93 of 1996) (NRTA)	The technical recommendations for highways (TRH 11): "Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads" outline the rules and conditions which apply to the transport of abnormal loads and vehicles on public roads and the detailed procedures to be followed in applying for exemption permits are described and discussed. Legal axle load limits and the restrictions imposed on abnormally heavy loads are discussed in relation to the damaging effect on road pavements, bridges, and culverts. The general conditions, limitations, and escort requirements for abnormally dimensioned loads and vehicles are also discussed and reference is made to speed restrictions, power/mass ratio, mass distribution, and general operating conditions for abnormal loads and vehicles. Provision is also made for the granting of permits for all other exemptions from the requirements of the National Road Traffic Act and the relevant Regulations.	SANRAL – national roads Northern Cape DoT	An abnormal load / vehicle permit may be required to transport the various components to site for construction. These include route clearances and permits will be required for vehicles carrying abnormally heavy or abnormally dimensioned loads (transport vehicles exceeding the dimensional limitations (length) of 22m). Depending on the trailer configuration and height when loaded, some of the BESS and associated infrastructure components may not meet specified dimensional limitations (height and width) and will therefore require a permit.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	Provincial Policies / Legislation		
Northern Cape Nature Conservation Act (Act No. 9 of 2009)	This Act provides for the sustainable utilisation of wild animals, aquatic biota and plants; provides for the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora; provides for offences and penalties for contravention of the Act; provides for the appointment of nature conservators to implement the provisions of the Act; and provides for the issuing of permits and other authorisations. Amongst other regulations, the following July apply to the current project: » Boundary fences July not be altered in such a way as to prevent wild animals from freely moving onto or off of a property; » Aquatic habitats July not be destroyed or damaged; » The owner of land upon which an invasive species is found (plant or animal) must take the necessary steps to eradicate or destroy such species; The Act provides lists of protected species for the Province.	Northern Cape Department of Agriculture, Environmental Affairs, Rural development and Land Reform	A collection/destruction permit must be obtained from Northern Cape Nature Conservation for the removal of any protected plant or animal species found on site. A pre-construction walk-through of the site is required in order to determine the precise species and location for the permit application.
GNR 805 of 29 May 2019 under the Astronomy Geographic Advantage Act, No. 21 of 2007	These regulations apply to specified activities within the Sutherland Central Astronomy Advantage Area declared for optical astronomy purposes and related scientific endeavours. The restriction of the specified activities within the Sutherland Central Astronomy Advantage Area is intended to protect the optical astronomy observations carried out within the Sutherland Core Astronomy Advantage Area from a detrimental impact. The regulation sets out minimum lighting levels for specified activities within the Sutherland Central	Department of Science and Technology	All construction activities must be in accordance with these regulations, in particular by obtaining earthwork approval from the DST prior to construction commencing, and adherence of lighting types and levels on site to the minimum standards specified in the regulations.

Legislation	Applicable Requirements	Relevant Authority	Compliance Requirements
	Astronomy Advantage Area, including establishing a minimum acceptable night time brightness levels, as well as prescribed conditions for lighting activities and the nature of lighting used. In addition, dust and wind turbine conditions are provided within the Sutherland Central Astronomy Advantage Area. The regulation state that: (1) Unless authorised by the management authority, no person may allow any general area lighting and outdoor recreational lighting activities within the Sutherland Central Astronomy Advantage Area to cause the average night sky brightness stated in sub -regulation 3(2) to be exceeded within the Sutherland Core Astronomy Advantage Area. In addition to: 5. Activities creating air pollution (1) Any person who intends to conduct any activity within the Sutherland Central Astronomy Advantage Area that may involve any earth works creating dust, must submit an application on the prescribed form (Annexure B), a copy of which can be obtained from the management authority, for approval by the management authority prior to commencing such activities. Fines of up to R 200 000.00 are determined for any intentional contravention of the regulations		

CHAPTER 5: DESCRIPTION OF THE RECEIVING ENVIRONMENT

This chapter provides a description of the environment that may be affected by the development of the Gunstfontein BESS and associated infrastructure. This information is provided to assist the reader in understanding the possible effects of the project on the environment within which it is proposed to be developed. Aspects of the biophysical and social environment that could be directly or indirectly affected by, or could affect, the BESS and associated infrastructure have been described. This information has been sourced from both existing information available for the area as well as from inputs from specialist consultants, and aims to provide the context within which this BA process is being conducted.

5.1 Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report

This chapter of the BA Report includes the following information required in terms of Appendix 1: Content of BA Reports:

Requirement	Relevant Section
3(h)(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, heritage and cultural aspects	The environmental attributes associated with the BESS and associated infrastructure and the broader environment are described and considered within this chapter and include the following:
	» The regional and social setting within which the BESS and associated infrastructure is located is described in section 5.2.
	» The climatic conditions of the Sutherland area are described in section 5.3.
	» The biophysical characteristics of the broader study area and the surrounding areas, as well as for the BESS and associated infrastructure, are described in section 5.5. This includes the topography, soils and agricultural potential, the ecological profile (including fauna, flora) of the broader study and the 500m assessment zone surrounding the Gunstfontein Substation.
	» The heritage of the affected environment (including archaeology, palaeontology and cultural landscape) is discussed in section 5.6.

A more detailed description of each aspect of the affected environment is included in the specialist reports contained within the **Appendices D-G.**

5.2. Regional Setting

The Northern Cape Province is located in the north-western extent of South Africa and constitutes South Africa's largest province, occupying an area of 372 889km² in extent, equivalent to nearly a third (30.5%) of the country's total land mass. It is also South Africa's most sparsely populated province with a population of 1, 145, 861, and a population density of 3.1/km². The capital city is Kimberley, and other important towns include Upington, Springbok, Kuruman, De Aar and Sutherland. It is bordered by the Western Cape, and Eastern Cape Provinces to the south, and south-east, Free State, and North West Provinces to the east, Botswana and Namibia, to the north, and the Atlantic Ocean to the west. The Northern Cape is the only

South African province which borders Namibia and plays an important role in terms of providing linkages between Namibia and the rest of South Africa. The Orange River, which is South Africa's largest river, is a significant feature and is also the main source of water in the Province, while also constituting the international border between the Northern Cape (i.e. South Africa) and Namibia.

The Northern Cape is rich in minerals including alluvial diamonds, iron ore, asbestos, manganese, fluorspar, semi-precious stones and marble. The mining sector in the province is the largest contributor of the provincial Gross Domestic Product (GDP) and of a great importance to South Africa as it produces ~37% of the country's diamonds, 44% of its zinc, 70% of its silver, 84% of its iron ore, 93% of its lead and 99% of its manganese.

The province has fertile agricultural land in the Orange River Valley, especially at Upington, Kakamas and Keimoes, where grapes and fruit are cultivated intensively. The interior Karoo relies on sheep farming, while the karakul-pelt industry is one of the most important in the Gordonia District of Upington. Wheat, fruit, peanuts, maize and cotton are produced at the Vaalharts Irrigation Scheme near Warrenton. The agricultural sector employs approximately 19.5% of the total formally employed individuals. The sector is also experiencing significant growth in value-added activities, including game-farming, while food production and processing for the local and export markets is also growing significantly (PGDS, July 2011). Furthermore, approximately 96% of the land in the province is used for livestock and game farming, whilst, approximately 2% is used for crop farming mainly under irrigation in the Orange River Valley and the Vaalharts Irrigation Scheme.

The Northern Cape offers unique tourism opportunities including wildlife conservation destinations, natural features, historic sites, festivals, cultural sites, star gazing, adventure tourism, agricultural tourism, ecotourism, game farms, and hunting areas, etc. The Province is home to the Richtersveld Botanical and Landscape World Heritage Site, which comprises a United Nations Educational, Scientific and Cultural Organisation (UNESCO) World Heritage Site under the World Heritage Convention. The province is also home to two (2) Transfrontier National Parks, namely the Kgalagadi Transfrontier Park, and the Richtersveld or Ai-Ais Transfrontier Park, as well as five (5) national parks and six (6) provincial reserves. In addition, the province plays a significant role in South Africa's science and technology sector, as it is home to the Square Kilometre Array (SKA), the Southern African Large Telescope (SALT), and the Karoo Array Telescope (MeerKAT).

The Northern Cape is made up of 5 district municipalities, namely Francis Baard, John Taolo Gaetsewe, Namakwa, Pixley ka Seme and ZF Mgcawu (refer to **Figure 5.1**).

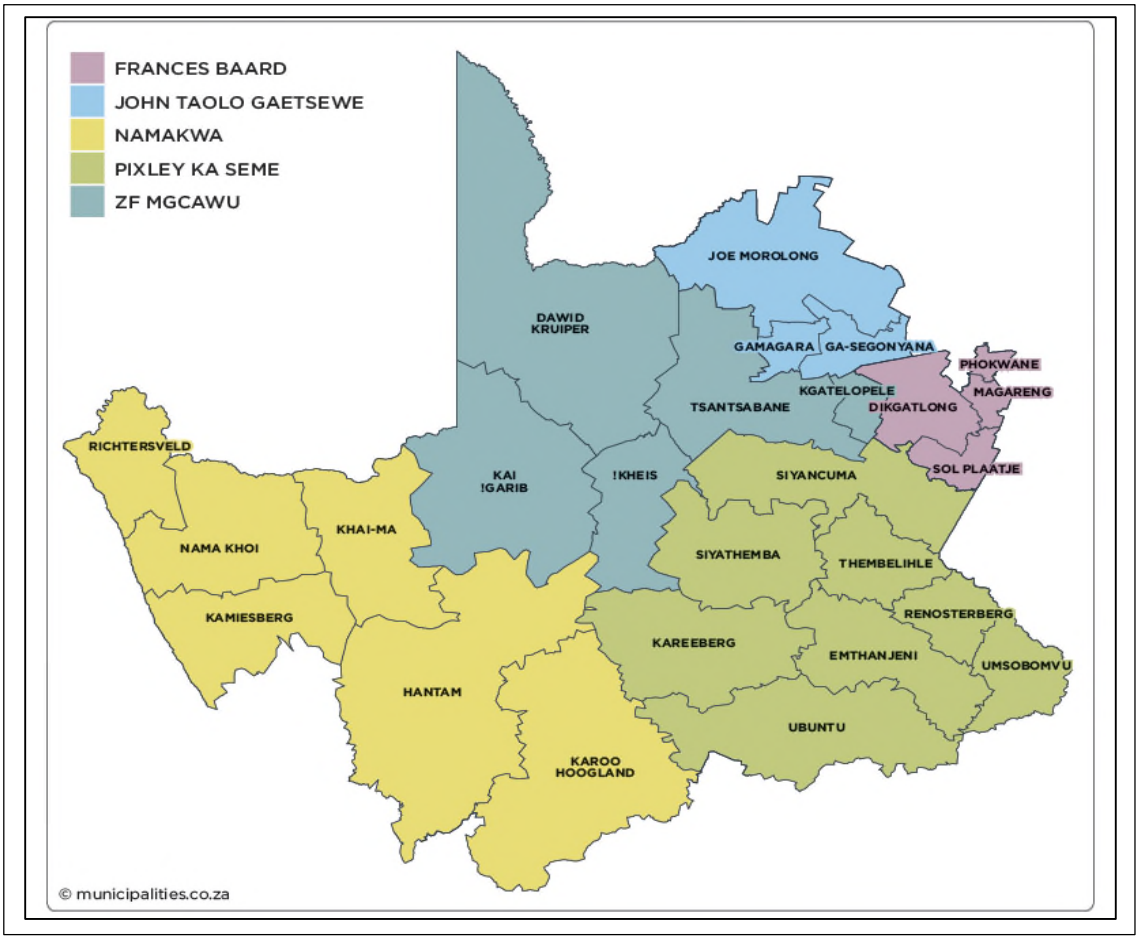

Figure 5.1: District municipalities of the Northern Cape Province (Source: Municipalities of South Africa).

The Namakwa District Municipality is a Category C municipality located in the Northern Cape Province. It is bordered by Namibia in the north, ZF Mgcawu Local Municipality in the north-east, Cape Winelands District Municipality in the south, West Coast District Municipality in the south-west, Pixley Ka Seme District Municipality in the east, Central Karoo District Municipality in the south-east, and the Atlantic Ocean in the west.

It is the largest district in the province, approximately 126 836km² in extent, making up over a third of its geographical area. It is comprised of six local municipalities: Nama Khoi, Hantam, Khai-Ma, Kamiesberg, Karoo Hoogland and Richtersveld (refer to **Figure 5.2**).

Figure 5.2: Local Municipalities of the Namakwa DM (Source: Municipalities of South Africa).

The seat of the Namakwa District Municipality is Springbok. Other Cities of this District include Aggeneys, Alexander Bay, Brandvlei, Bulletrap, Calvinia, Carolusberg, Concordia, Eksteensfontein, Frasersburg, Garies, Hondeklip Bay, Kamieskroon, Kleinzee, Koingnaas, Komaggas, Kuboes, Leliefontein/Kamiesberg, Loeriesfontein, Middelpos, Nababeep, Nieuwoudtville, O'Kiep, Onderste Doorns, Pella, Pofadder, Port Nolloth, Richtersveld, Sanddrift, Steinkopf, Sutherland and Williston.

The broader study area for the Gunstfontein BESS and associated infrastructure is located within the Karoo Hoogland LM. The Karoo Hoogland LM is a Category B municipality and is situated in the Namakwa District of the Northern Cape Province. It is the second largest of the six municipalities in the district, making up a quarter of its geographical area, with an extent of 30 230km², accounting for a quarter of the DMs geographical area. The key towns within the LM include, Frasersburg, Sutherland and Williston.

The community, social and personal services sector with 42.5%, is the biggest contributor of the LM's GDP and of great importance to the economy of the Namakwa DM. The transport, storage and communication sector contribute 15%, the wholesale and retail trade, catering and accommodation sector contribute 13.7%, the agriculture, forestry and fishing sector contribute 13%, the finance, insurance, real estate and business services sector contribute 8.8% and the manufacturing sector 5.9%.

Karoo Hoogland Municipality has a total population of approximately 11 601 according to STATS SA Survey done in 2011. The three main towns in Karoo Hoogland, as stated above, Williston, Fraserburg and Sutherland which are respectively 499 km, 592 km and 539 km from Springbok. Karoo Hoogland Municipality is devided into 4 Wards and there is an estimate of 2204 households in the area serviced by the Municipality.

The population distribution in Karoo Hoogland Municipality is: Fraserburg: 23% of total population, Non-Urban areas (Rural): 31% of total population, Sutherland: 19% of total population and Williston: 27% of total population. It is evident that the most significant portion of Karoo Hoogland's urban population resides in Williston (27%). The Karoo Hoogland LM also has a large rural population, with 31% of its population residing in the non-urban (NU) regions within the Municipality which covers approximately 99% of the LMs geographical area.

The age distribution of a population is important because the largest age group inevitably indicates its own demands on the market. Many residents are still dependent on government grants and is the unemployment rate currently 23.1%. This has a negative influence on the payment of services and a total of 1035 households are subsidized by the service subsidized scheme. The Karoo Hoogland population can be regarded as having a high dependency ratio. With 10.6% of the population over the age of 65 and 24.5% are under 15 years. The latter youth group will be demanding education, housing and jobs in the near future. The Karoo Hoogland gender distribution is 47, 8% males and 52, 2% females.

According to the 2011 Census data, 3 655 people are employed, 623 are unemployed, and 395 are classified as discouraged work-seekers. The unemployment rate is ~14,6%. Amongst the youth (aged 15 – 34 years), 1 317 people are employed, 329 are unemployed, 218 are classified as discouraged work-seekers, and 1 433 are not economically active. The unemployment rate is thus relatively high.

The closest town to the Gunstfontein BESS and associated infrastructure broader study area is Sutherland, which is located approximately 45km to the north.

5.3. Climatic Conditions

The climate is arid to semi-arid. Rainfall July fall at any time of the year, although there is a peak in autumn / winter on the lowlands and slightly earlier (March) on the uplands. Mean temperatures of the mountainous regions are generally lower than the plains to the south of the escarpment. Frost is a common phenomenon in the mountainous areas with up to 50 days of frost per year. Mean annual rainfall is 180 to 200 mm per year.

Altitude has a strong influence on most climatic variables. Generally, an increase in altitude corresponds with a decrease in temperature and an increase in rainfall. Mountains also have an orographic influence on rainfall, escarpment zones usually experiencing increased rainfall and mist, depending on aspect, cause either an increase or decrease in mean daily insolation levels. The study site is located just south of the Great Escarpment and the climate is therefore strongly influenced by the presence of these mountains.

All areas with less than 400 mm annual rainfall are arid. The study site can therefore be regarded as arid to very arid area.

5.4 Land use And Landcover of The Study Area

Stock farming (mostly sheep) is the traditional mainstay of the economies of Karoo Hoogland Local Municipality areas. Economically viable farming units are spatially extensive (around Sutherland, ~7 000 ha). In the case of Sutherland, the Sutherland Observatory, located approximately 15km east of Sutherland, is internationally renowned, and attracts both local and international visitors and scientists. The town itself has seen some modest growth as a lifestyle resettlement destination over the past decade. Tourist flows into the study area municipality is currently limited, and mainly associated with the town of Sutherland (observatory) and the small Victorian rail siding of Matjiesfontein, which is located approximately 30 km west of Laingsburg.

Landcover data for the area (Fairbanks et al. 2000) indicates that most of the surroundings are in a natural condition. There are some small areas indicated as cultivation in the valley bottoms. The natural parts of the landscape consist primarily of "shrubland and low fynbos" (Fairbanks et al. 2000).

5.5. Biophysical Characteristics of the broader study area and 500m assessment zone surrounding the Gunstfontein Substation

5.5.1. Broad-Scale Vegetation Description

According to the national vegetation map (Mucina & Rutherford 2006/2018), there are two vegetation types within the affected area Roggeveld Shale Renosterveld and Tanqua Escarpment Shrubland (**Figure 5.3**). The BESS 500m assessment region is however restricted entirely to the Roggeveld Shale Renosterveld vegetation type. Roggeveld Shale Renosterveld occurs in the Northern and Western Cape and occupies the majority of the Roggeveld from the Western edge of the Great Escarpment mostly above the Tanqua Basin, reaching as far east as the higher-lying areas of the Teekloof Pass south of Fraserburg along the northwest summit plateaus of the Nuweveldberge. It occupies undulating, slightly sloping plateau landscapes, with low hills and broad shallow valleys supporting mainly moderately tall shrublands dominated by renosterbos with a rich geophytic flora in the wetter and rocky habitats. It occurs mostly on mudrocks and sandstones of the Adelaide Subgroup. The land types present are mostly Fc and Da. Mucina & Rutherford (2006) list 12 endemic species for this vegetation type, which is a large number given that the total extent of the vegetation type is only 2917 km^2.

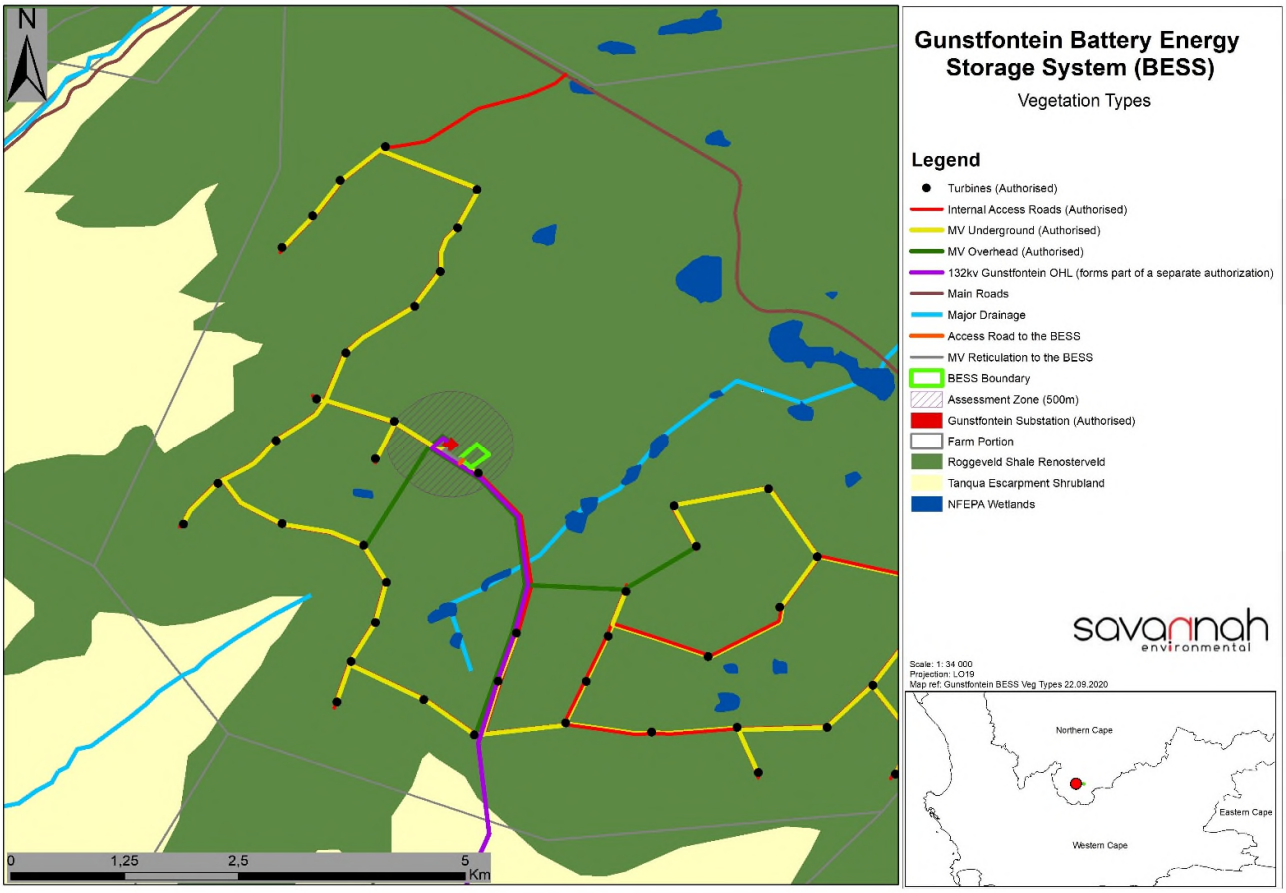

Figure 5.3: Broad-scale overview of the vegetation in and around the Gunstfontein substation and BESS study area. The vegetation map is an extract of the national vegetation map (Mucina & Rutherford 2006 & 2018 update) and also includes drainage lines delineated by the NFEPA assessment (Nel et al. 2011).

5.5.2. Fine-Scale Vegetation Description

The area around the approved substation site for the Gunstfontein WEF consists of typical Roggeveld Shale Renosterveld. There are however several different habitats present within the 500m assessment region around the substation site which are illustrated and described below (**Figure 5.4**).

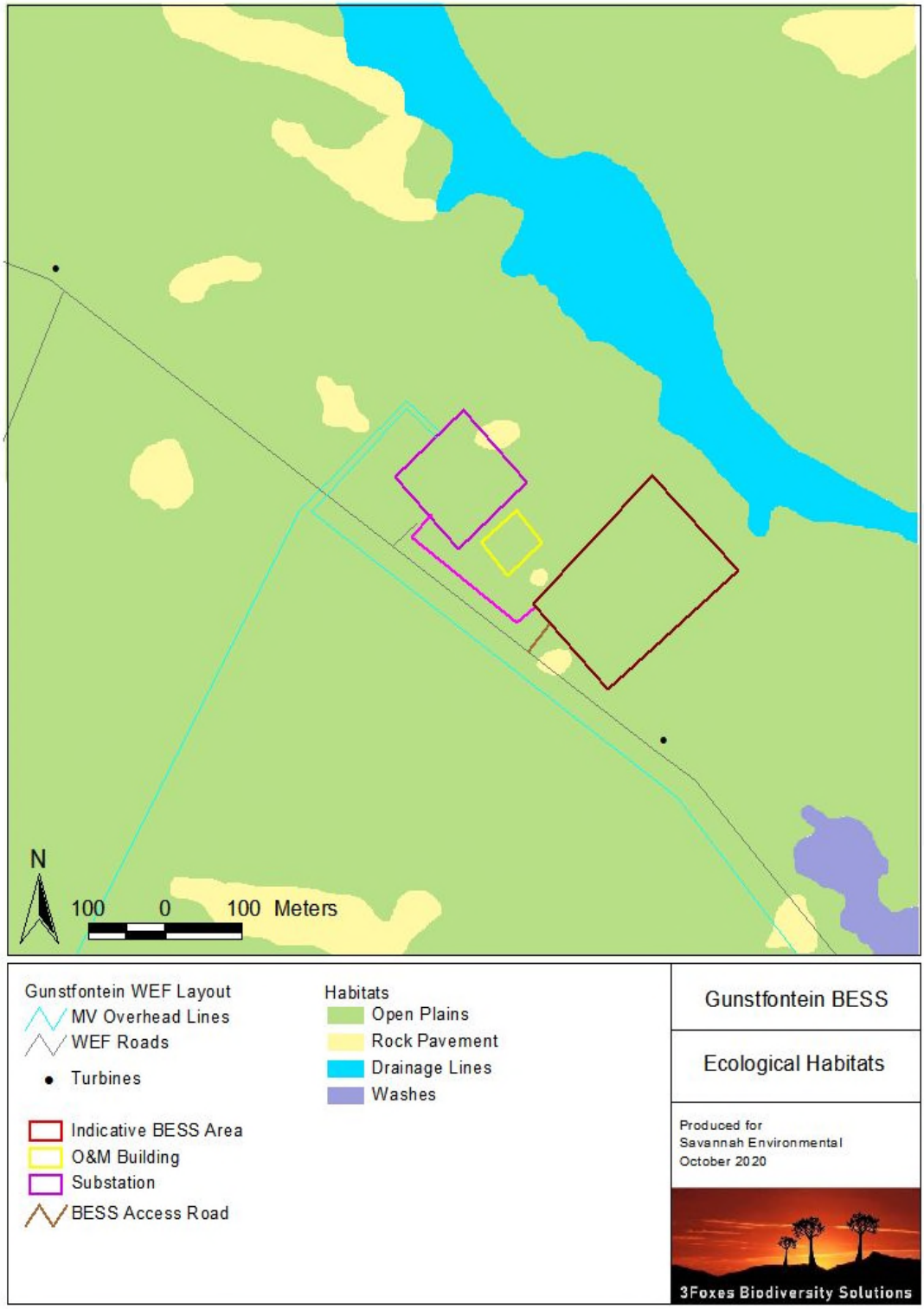

Figure 5.4: Ecological habitats observed within the Gunstfontein BESS 500m assessment region (entire frame) and which are described in detail below.

The majority of the BESS area consists of Roggeveld Shale Renosterveld typical of the Sutherland Plateau area. The soils are fine-textured but sandy soils and are generally quite shallow with several areas of exposed bedrock within the BESS area. There are also a few areas of deeper soils which can be recognized by their somewhat taller vegetation. Typical and dominant species observed within the BESS study area include *Euryops lateriflorus, Dimorphotheca cuneata, Selago saxatilis, Rosenia oppositifolia, Pteronia tricephala, Pentzia punctata, Euryops annae, Dicerothamnus rhinocerotis, Ehrharta calycina, Ehrharta eburnea* (NT), *Senecio erosus*, *Romulea tortuosa* subsp. *tortuosa*, *Asparagus capensis*, *Euryops multifidus*, *Poa bulbosa*, *Oxalis obtusa*, *Berkheya spinosa*, *Chrysocoma ciliata*, *Romulea atrandra* var. *atrandra, Colchicum coloratum* subsp. *burchellii*, *Othonna auriculifolia*, *Diospyros austro-africana*, *Oxalis melanosticta* var *melanosticta* and *Oxalis pocockiae*.

Figure 5.5: The typical Roggeveld Shale Renosterveld on shallow soils within the BESS 500m study region. This habitat is considered relatively low sensitivity and is considered acceptable for the location of the BESS.

Figure 5.6: Roggeveld Shale Renosterveld on deeper soils within the BESS study area, with taller shrubs dominated by *Euryops lateriflorus*.

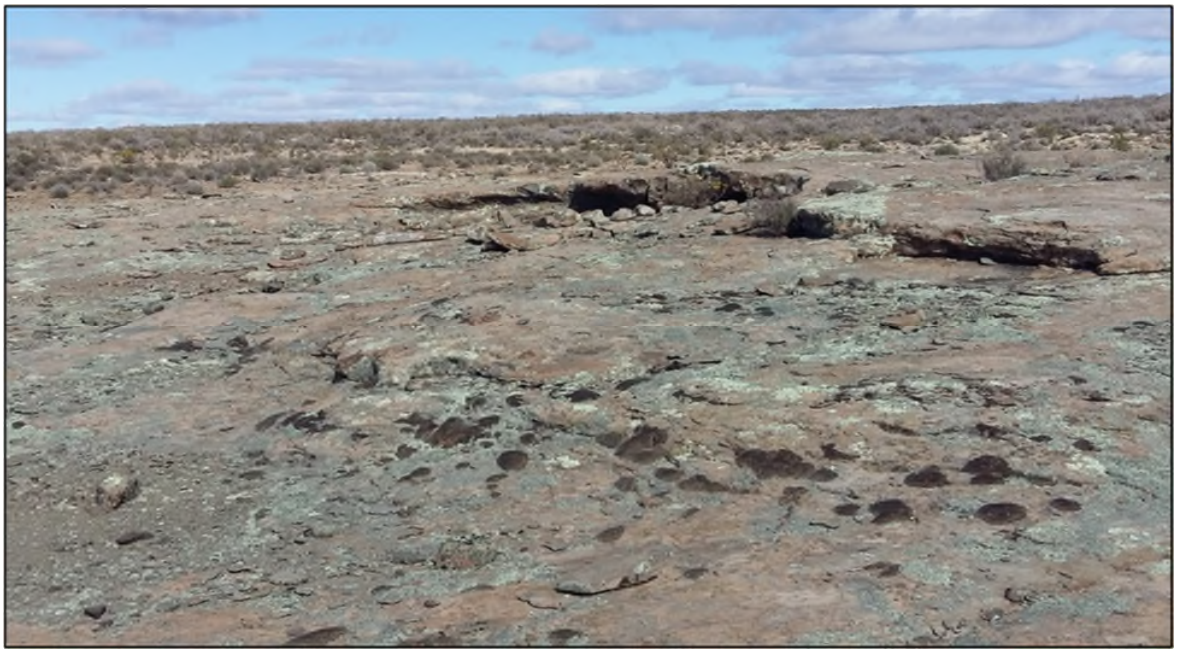

Figure 5.7: There are several areas of exposed bedrock within the BESS study area. Although there is very little vegetation associated with these areas and they are not considered important from a botanical point of view, they were observed to be a relatively important local habitat for reptiles and other fauna which prefer rocky habitats.

5.5.3. Listed and Protected Plant Species

It is important to note that the site falls within the Komsberg Centre of Diversity and Endemism and as such is an area with a known high abundance of species of concern and endemism. A list of species of conservation concern recorded from the wider area is provided in Annex 1. Species of concern observed at the site during the field assessment includes *Eriocephalus grandiflorus* (Rare) and *Ehrharta eburnea* (NT) which are both quite widespread species that have healthy populations outside of the affected area. Although it is possible that the development would generate some impact on these species, this would be minor as it is highly unlikely that the local populations would be compromised in any way by the development. Overall, the abundance of plant SCC within the site is low and the impact of the development on SCC would be acceptable and low.

In terms of the provincial legislation the following species and genera are protected and would require specific consideration during the pre-construction walk-through of the BESS footprint. The example species provided are to illustrate the typical species present and is not intended as an exhaustive list.

Schedule 1 (Specially Protected Species):

- All species of the genus Pelargonium (Family: Geraniaceae) (e.g. *Pelargonium rapaceum*)

Schedule 2 (Protected Species):

- All species of the family Mesembryanthemaceae: (e.g. *Antimima pumila, Hammeria salteri, Cheiridopsis namaquensis, Lampranthus spp., Cleretum papulosum subsp. papulosum, Drosanthemum spp., Ruschia centrocapsula*)
- All species of the family *Amaryllidaceae*: (e.g. *Brunsvigia* spp (*B. bosmaniae*), *Haemanthus coccineus*)
- All species of the genus *Colchicum* (Family Colchicaceae): e.g. (*Colchicum coloratum, C.*
- *Cuspidatum)*.
- All species of the family *Crassulaceae*; e.g. (*Tylecodon wallichii, T. ventricosus, Crassula deltoidea, C. columnaris, C. muscosa, C. umbella, C. glomerata*, *Adromischus filicaulis*)
- All species of the family *Iridaceae*: (e.g. *Romulea atrandra, R. tortuosa, komsbergensis, Hesperantha acuta, Moraea fugax)*
- All species of the genus *Oxalis* (Family: *Oxalidaceae*): (e.g. *Oxalis obtusa, O. melanostica, O.palmifrons*)
- All species of the genus Lachenalia (Family: *Hyacinthaceae*): (e.g.*Lachenalia aurioliae*)

It is recommended that a Pre-construction Walk-Through Survey is conducted within the final BESS footprint, to inform search-and-rescue efforts. Species of concern should be recorded and may only be removed, transplanted, destroyed (or any other form of disturbance) after the necessary approval (permits) has been obtained from the relevant authority, i.e. the Department of Agriculture, Environmental Affairs, Rural Development and Land Reform. It is also important to note that species of ecological importance, local endemics and red-listed species should be translocated out of the development footprint, where these have a high probability of survival. These would be identified during the preconstruction walk-through.

5.5.4. Faunal Communities

Mammals

The Gunstfontein BESS site is likely to have moderate to low mammalian species richness. The BESS site falls within or near the edge of the distribution range of at least 44 terrestrial mammals. Within the broader area, the ridges, hills and uplands, with rocky outcrops, rocky bluffs and cliffs provide suitable habitat for species which require or prefer rock cover such as Cape Rock Elephant Shrew, *Elephantulus edwardii*, Hewitt's Red Rock Hare *Pronolagus saundersiae*, Namaqua Rock Mouse *Micaelamys namaquensis* and Rock Hyrax, *Procavia capensis*. Larger species commonly observed in the area include Grey Rhebok, *Pelea capreolus* (Near Threatened) which is likely to use the area on a fairly regular basis and Klipspringer, *Oreotragus oreotragus* which are not likely to be resident in the BESS area as the habitat is not rugged enough to provide cover for this species. The introduced Fallow Deer, *Dama dama* is also common in the area and is likely to occur at the site on occasion. The lower-lying parts of the area are home to species associated with more densely-vegetated lowland habitats on deeper soils and along drainage lines and floodplains, which includes Brants's Whistling Rat *Parotomys brantsii*, the Bush Vlei Rat *Otomys unisulcatus*, Hairy-footed Gerbil *Gerbillurus paeba* and Common Duiker *Sylvicapra grimmia*. Most of these species are likely to be resident within the BESS area or would be using this area on a fairly regular basis.

Listed species which do or may occur at the site include the, Grey Rhebok (Near Threatened) Black-footed Cat *Felis nigripes* (Vulnerable), Leopard *Panthera pardus* (Near Threatened) and Riverine Rabbit *Bunolagus monticularis* (Critically Endangered). All of these species have relatively large ranges across South Africa and the development of the BESS would result in an insignificant extent of habitat loss for these species. Although the Riverine Rabbit *Bunolagus monticularis* is known to occur in the wider area, it is not currently known from the plateau in the affected area and it is considered highly unlikely to be present within the 500m assessment region affected by the BESS. Due to the small footprint of the BESS and its proximity to the approved substation infrastructure, it is not likely that there would be any significant degree of habitat loss for mammals as a result of the construction and operation of the BESS.

Overall there do not appear to be any significant issues regarding mammals and the development of Gunstfontein BESS. In general, the major impact associated with the development of Gunstfontein BESS for mammals would be some localised and minor habitat loss and disturbance during construction and operation.

Reptiles

According to the distribution maps available in the literature, as many as 50 reptiles could occur within the broad area around the BESS. However, according to the records within the Virtual Museum database, only 35 species have been recorded within the 3220 degree square, suggesting that the actual number of reptile species present at the site is likely to be relatively low. In terms of species of conservation concern, the only listed species recorded in the area is the Karoo Padloper *Homopus boulengeri* which is listed as Near Threatened. Although it is possible that this species moves through the BESS area on occasion, it is highly unlikely to be present within the affected area as there not sufficient rock cover for shelter for this species and so it considered highly unlikely to present or be affected by the BESS.

Species commonly observed in the wider area on previous field assessments include the Karoo Tent Tortoise *Psammobates tentorius tentorius*, Angulate Tortoise *Chersina angulata*, Puff Adder *Bitis arietans*, Karoo Girdled Lizard *Cordylus polyzonus*, Southern Rock Agama *Agama atra*, Namaqua Plated Lizard *Gerrhosaurus typicus*, Cape Skink *Mabuya capensis*, Variegated Skink *Trachylepis variegata*, Common Sand Lizard *Pedioplanis lineoocellata pulchella* and Cape Cobra *Naja nivea*. While the BESS is likely to result in some localised habitat loss for such typical resident species, there are no parts of the BESS study area that

are considered to be especially important or sensitive in terms of reptile abundance or diversity. In terms of impacts of the development on reptiles, the major impact is likely to come from disturbance during the construction phase which would be transient and localised and consequently of low long-term consequence.

Figure 5.8: Common reptiles observed at the site include, from top left, the Variegated Skink, Common Sand Lizard, Ground Agama and Karoo Girdled Lizard.

Amphibians

Only seven amphibians are likely to occur in the area, indicating that the frog diversity of the site is likely to be low. No listed species are likely to occur in the area. All of the species recorded in the area are widespread species of low conservation concern. Species such the Cape River Frog *Amietia fuscigula* occur along the larger drainage lines in pools and in the farm dams of the area. Species such as Karoo Caco *Cacosternum karooicum*, Karoo Toad *Vandijkophrynus gariepensis* and Cape Sand Frog *Tomopterna delalandii* are less dependent on water and are likely to be more widespread. Given the general aridity and low likely abundance of amphibians within the area, impacts on amphibians are likely to be localised and of a low significance.

Avifauna

Approximately 120 bird species are known to occur within the broader project area (Appendix 5). The bird assemblage of the study area and surrounds is fairly typical of the Succulent Karoo Biome. A number of small passerines that are considered common within the renosterveld and succulent karoo scrub that characterises the area and are considered endemic/near-endemic and biome-restricted (Table 1). Some of these species are nomadic, such as the Black-headed Canary *Serinus alario* and Lark-like Bunting *Emberiza impetuani*, which may be absent in some years. Seemingly cryptic species such as Cinnamon-

breasted Warbler is not uncommon along the Great Escarpment and is usually restricted to rocky ridges and scree with vegetation cover. Other species of some importance include the Karoo Lark *Calendulauda albescens*, Cape Clapper Lark *Mirafra apiata,* and Karoo Long-billed Lark *Certhilauda subcoronata.* While many of these and other species are endemic/near-endemic and biome-restricted, all of these species are widely distributed in the Karoo and Fynbos Biomes.

Species of concern present in the area (Table 1) includes three Endangered species, namely Ludwig's Bustard *Neotis ludwigii,* Martial Eagle *Polemaetus bellicosus* and Black Harrier *Circus maurus*. Species of secondary concern which have also been recorded in the area include Verreaux's Eagle *Aquila verreauxii,* Lanner Falcon *Falco biarmicus* and Black Stork (*Ciconia nigra)*. Verreaux's Eagle is the most abundant of the large raptor species in the area, while the latter two species are significantly scarcer. Black Stork often frequent farm dams, not only singly but also in small congregations. The Vulnerable Southern Black Korhaan *Afrotis afra* and the Near-Threatened Karoo Korhaan *Eupodotis vigorsii* are found throughout the region and have also been recorded in the wider area.

Table 5.2. Priority species identified in the project site and surrounds based on their conservation status (Taylor *et al*.,2015), regional endemism (Birdlife South Africa, 2019), and priority score (Retief *et al*., 2011).

Species	Cons. Status	Endemic/Near-endemic	Priority Score	SABAP1 reporting rate (%)	Susceptible to
Bustard, Ludwig's	EN		320	6	Collisions
Buzzard, Common (Steppe)			210	18	Collisions/disturbance
Buzzard, Jackal		NE	250	6	Collisions/disturbance
Crane, Blue	NT		320		Collisions
Eagle, Black-chested Snake			230		Collisions/disturbance
Eagle, Booted			230	6	Collisions/disturbance
Eagle, Martial	EN		350	6	Collisions/electrocution
Eagle, Verreaux's	VU		360	6	Collisions/electrocution
Falcon, Lanner	VU		300		Collisions/disturbance
Flamingo, Greater	NT		290		Collisions
Francolin, Grey-winged		SLS	190	6	Disturbance/habitat loss
Goshawk, Pale Chanting			200	41	Disturbance/habitat loss
Harrier, Black	EN	NE	345	12	Collisions/disturbance/habitat loss
Harrier-hawk, African			190		Disturbance/habitat loss
Kestrel, Rock				59	Disturbance/habitat loss
Kite, Black-winged			174	29	Disturbance/habitat loss
Korhaan, Karoo	NT		240		Collisions/disturbance/habitat loss
Korhaan, Southern Black	VU	E	270	18	Collisions/disturbance/habitat loss
Owl, Cape Eagle-			250		Disturbance/habitat loss
Owl, Spotted Eagle-			170	6	Disturbance/habitat loss
Pipit, African Rock	NT	SLS	200		Disturbance/habitat loss

Sparrowhawk, Rufous-breasted			170		Disturbance/habitat loss
Stork, Black	VU		330	6	Collisions/electrocutions

The Near-Threatened Blue Crane *Grus paradisea* and Greater Flamingo *Phoenicopterus ruber* are both rare in the region, but may occasionally be present. According to SABAP2 records, Blue Crane has only been recorded in a few pentads within a 50km radius of the project site, while Greater Flamingo have been recorded in a number of pentads, along the plateau of the Great Escarpment where they frequent large farm dams. Both species may however pass through the area *en route* between focal sites, with flamingos possibly commuting in small flocks. African Rock Pipit is not uncommon along the escarpment to the and have also been recorded in the area (EWT, 2014).

The avifauna of the project site and broader area appears fairly typical of the Succulent Karoo Biome. However, due to the presence of a fair number of priority species, the sensitivity of the avifauna can be considered to be of medium significance. In terms of impact, the group of primary concern is the medium to large non-passerines, which include the large terrestrial birds and diurnal raptors. Many of these are also red-listed, such as Ludwig's Bustard, Martial eagle, and Black Stork. Most of these species are susceptible to collisions with power lines owing to reduced ability to see the power lines and reduced manoeuvrability in flight to avoid collisions (Martin & Shaw, 2010; Jenkins *et al.*, 2010; Jenkin *et al*., 2011; Shaw, 2013). However, the only species which are highly susceptible include Ludwig's Bustard and Black Stork (Jenkins *et al.*, 2010). An additional threat faced by the large raptors is electrocution when perched or attempting to perch on power line structures (Lehman *et al*., 2007), but this depends largely on the type of pylons or towers used. Electrocutions can further be avoided to a large extent by employing suitable mitigation methods. Disturbances during construction of the substation and BESS is also expected to have a negative impact by temporarily displacing birds from foraging habitat.

5.5.5. Critical Biodiversity Areas & Broad-Scale Processes

An extract of the Northern Cape Critical Biodiversity Areas map for the broader study area is depicted below in **Figure 5.9**. The entire BESS study area falls within an area classified as CBA 1. Development within CBAs is undesirable and can potentially lead to loss of biodiversity and negatively affect ecological processes. The impact of the current proposed BESS would be mediated by the proximity of the BESS to the facility substation and the low overall footprint of the BESS.

In terms of the ecological features and processes that may be affected by the development, these are partly described below in **Table 5.2** below, as they relate to the CBAs within the area. But more broadly speaking, the BESS site lies within an area of typical Roggeveld Shale Renosterveld with no features present that would suggest that the study area represents a particularly important corridor or process feature of the wider area. Important features of the area include the escarpment south of the site and the larger drainage features which occur mostly to the north and east of the BESS study area. All of these features are well outside of the BESS site and would not be affected by the BESS.

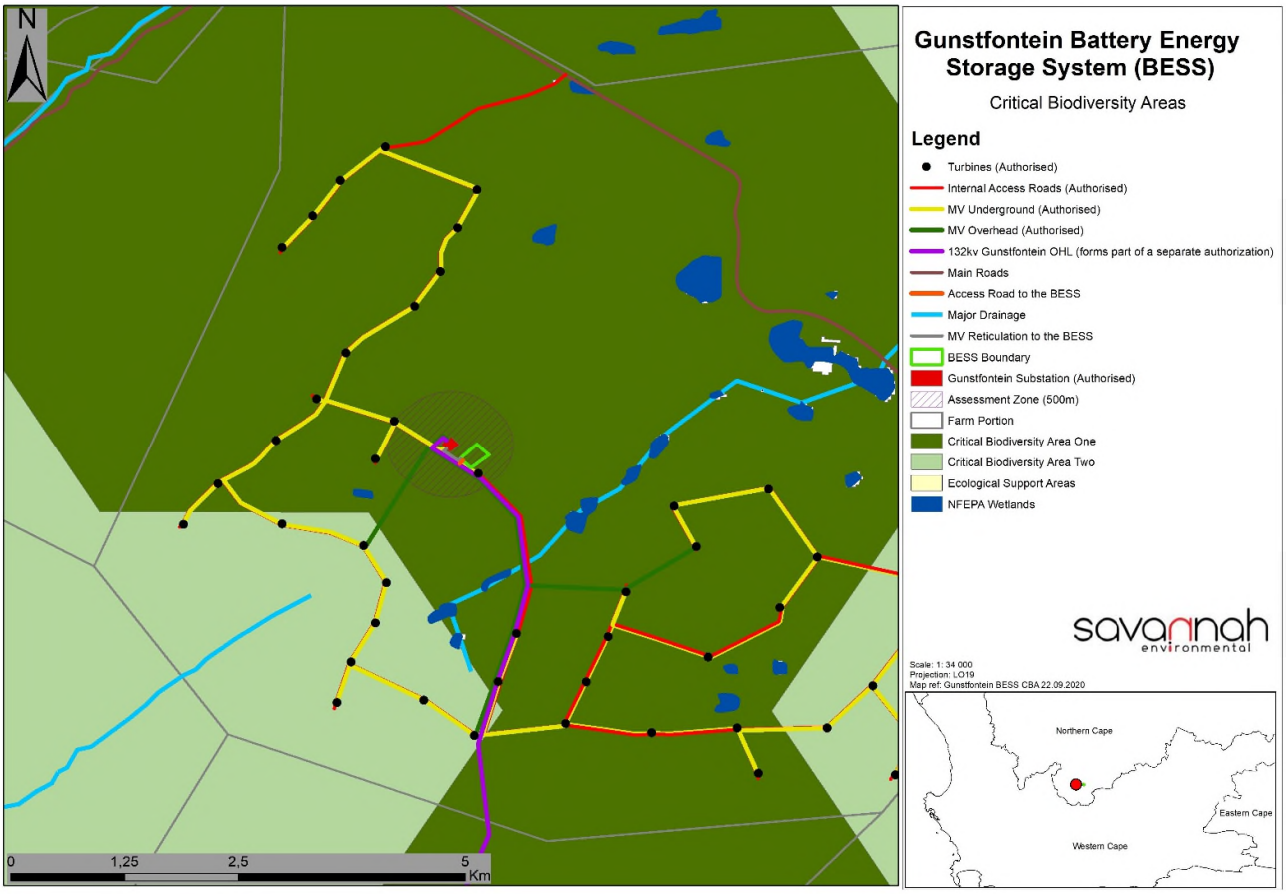

Figure 5.9: Extract of the Northern Cape Critical Biodiversity Areas map for the broader study area around the Gunstfontein BESS, showing that the BESS occurs within an area classified as CBA 1.

The loss of an additional ~5ha of habitat near to the approved substation would be very unlikely to compromise the ecological functioning of the affected CBA in any way. A summary of the underlying features associated with the CBA within the site is provided below in Table 1. It is important to note that apart from the process and representivity roles of the CBAs, the features of concern underlying the CBAs are not located within the 500m assessment zone, as these features are well outside of the 500m assessment region. In terms of the representivity of vegetation types, only Roggeveld Shale Renosterveld is within the site and the loss of less than 5ha of this vegetation type would not be significant, especially given that the field assessment indicated that the abundance of SCC within this area was low. In terms of the process features, the development would contribute to cumulative habitat loss and fragmentation in the area to some degree, but the specific contribution of the BESS at less than 5ha would not be sufficient to significantly compromise the functioning of these broad-scale ecological processes. Given the small footprint of the BESS and the avoidance of hydrological features at the site, the impact on the BESS on water runoff quality and quantity would be minimal and the overall impact on the affected catchment and hydrological processes would be negligible. In terms of the Strategic Water Source Areas (SWSAs) and Freshwater Ecosystem Priority

Areas (FEPAs), it is important to note that the 500m assessment region does not occur with either of the SWSA or NFEPA delineated wetland or river systems, and therefore these do not apply to this development. As such, the development of the BESS is considered acceptable in terms of CBAs and ecological processes.

Table 5.2. Reasons underlying the CBA 1 status of the site. The features are obtained from the reasons database associated with the Northern Cape CBA map available on the BGIS database.

Feature	Remarks
Roggeveld Shale Renosterveld	The development is less than 5ha in extent and would not contribute significantly to the loss of habitat within the Roggeveld Shale Renosterveld vegetation type which is still largely intact.
Threatened Species	Although there are some threatened species in the area, the BESS development would not compromise the local populations of any species of concern.
Natural Wetlands	There are no significant wetlands within the 500m assessment region. The wetlands underlying the CBA 1 are not within the 500m assessment region.
Rivers	There is a small drainage line within the 500m assessment region, but this can be avoided by placing the infrastructure in low or medium sensitivity regions. The CBA 1 status of the area is based on the presence of the larger drainage lines present in the wider area.
Large high value climate resilience areas	The rugged topography of the area and intact nature of the landscape provides it with climate change resilience. The footprint of the development at less than 5ha would not compromise this function of the landscape. The development would however contribute some degree towards cumulative habitat loss and fragmentation in the area. The specific contribution of the BESS is however insignificant compared to the existing or approved developments.
NPAES PA and Focus	These have changed since the 2011 NPAES and a new NPAES layer has been developed but has not been released as yet. The loss of less than 5ha to the BESS would not change conservation options in the area as it is already affected by approved and under construction wind farms.
Landscape structural elements	As with climate change resilience, this feature of the CBA 1 would not be significantly altered by the presence of the BESS. Based on the results of the field assessment it is unlikely that the affected area represents an important movement or migration corridor for any fauna and the presence of the BESS would be very unlikely to compromise the ability of fauna, flora or avifauna to move about the landscape.
PA distance buffers 5km & 10km	There are no mapped protected areas within 10km of the BESS 500m assessment region. There are no known formal protected areas in the vicinity of the 500m assessment region that would be affected by the BESS.

5.7. Heritage (including Archaeology, Palaeontology and the Cultural Landscape)

5.7.1. Archaeology and Built Environment Heritage

The Remainder of the Farm Gunstfontein 131 has been thoroughly assessed by Van der Walt in his report dated December 2015. In his assessment, he identified 8 sites of heritage significance which needed to be considered for the development of the Gunstfontein WEF. These sites have been mapped in **Figures 5.10, 5.11 and 5.12** below and documented in Appendix 1 of the Heritage Impact Assessment.

Van der Walt (2015) recorded a few background scatters of isolated stone artefacts in rocky areas consisting of miscellaneous LSA flakes and flaked pieces, usually located near to large boulders. These observations were not considered to be conservation-worthy. He further identified one rock art site as well as historical structures including two types of block house, ruins of agricultural structures and a stone cairn feature. None

of the identified heritage resources are located within or near to the area proposed for the BESS development.

As such, based on the archaeological information available for Farm Gunstfontein 131, it is unlikely that the proposed BESS development will negatively impact on significant archaeological heritage. However, Van der Walt (2015) has made recommendations that have been endorsed by SAHRA for the development of the WEF. It is recommended that these same recommendations are adopted for the development of the BESS.

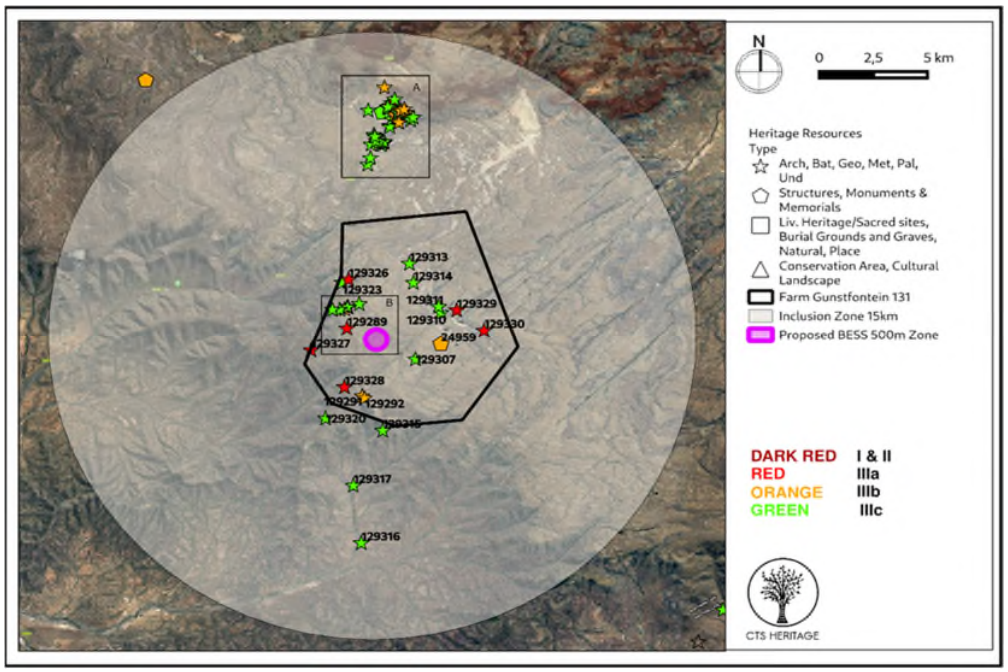

Figure 5.10: Previous HIAs Map. Previous Heritage Impact Assessments covering the proposed development area with SAHRIS NIDS indicated.

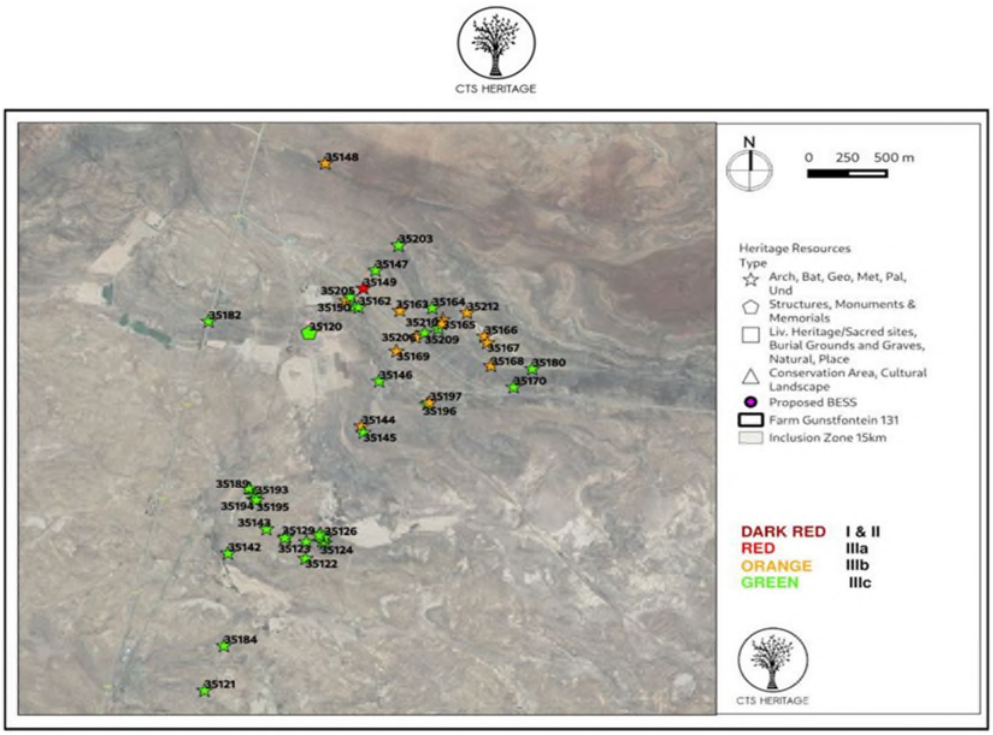

Figure 5.11: Heritage Resources Map Inset A.

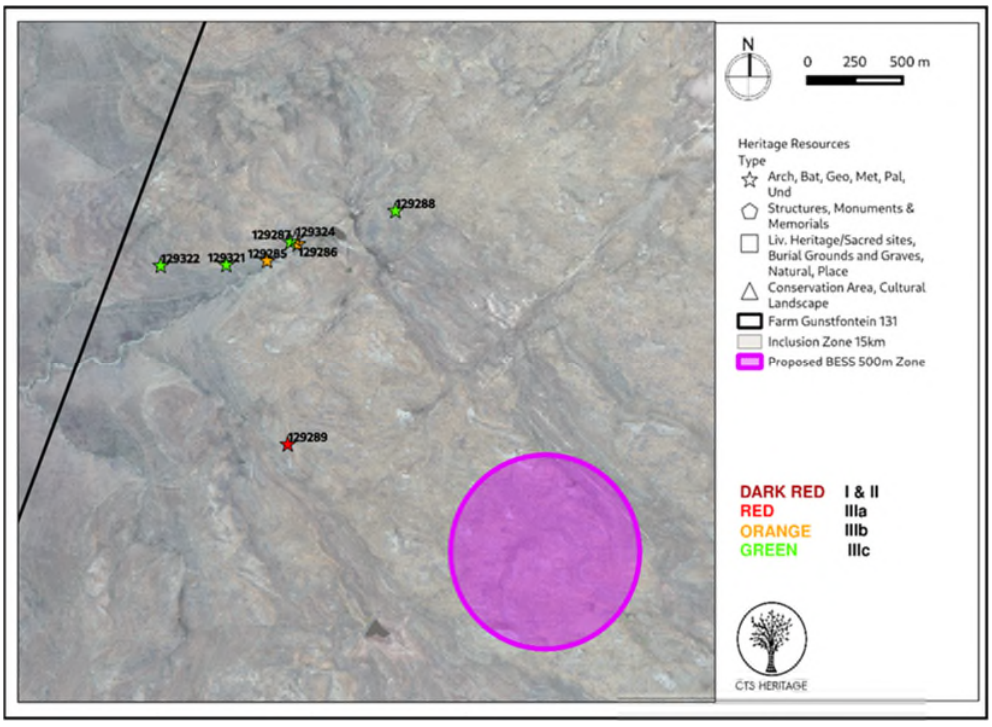

Figure 5.12: Heritage Resources Map Inset B indicating known sites in relation to the approved WEF layout and proposed BESS.

5.7.2. Palaeontology

The area proposed for development of the Gunstfontein BESS is underlain by sediments that have very high palaeontological sensitivity according to the SAHRIS Fossil Sensitivity Map (**Figure 5.13**). The geology map of the area (Council of GeoScience Map 3220 Sutherland, **Figure 5.14**) indicates that the area is underlain by sediments of the Karoo Supergroup assigned to the Beaufort group, within the Abrahamskraal Formation of the Adelaide Subgroup. Almond (2015) conducted a detailed palaeontological assessment for the proposed development and concluded that "the Lower Beaufort Group bedrocks within the Gunstfontein WEF study area are generally of low palaeontological sensitivity, and this also applies to the overlying late Caenozoic superficial sediments. Construction of the proposed Gunstfontein WEF is unlikely to entail significant impacts on local heritage resources. Due to the general scarcity of well-preserved fossil remains as well as the extensive superficial sediment cover observed within the study area, the overall impact significance of the construction phase of the proposed Gunstfontein WEF is assessed as LOW."

Almond (2015) noted that 5 uranium core occurrences had previously been identified on Gunstfontein Farm 131 (SAHRIS Site ID 129326 to 129330) located approximately 2.5km north of the 500m BESS assessment area. Almond (2015) notes that these uranium occurrences may well be associated with fossil plant material. In addition, Almond (2015) identified a site that features concentrations of woody plant fossils and koffieklip (SAHRIS SIte ID 129325). Both the uranium sites and the plant fossil site have been mapped in **Figures 5.10, 5.11 and 5.12.** Almond (2015) recommends that a 30m no-go buffer be implemented around both the uranium sites (SAHRIS Site ID 129326 to 129330) and the plant fossil site (SAHRIS Site ID 129325). SAHRA recommended that this buffer be enlarged to 60m as per their comments dated 10 March 2016 and 20 June 2016. In the new layout that is currently proposed, all infrastructure is located more than 100m away from the identified uranium anomalies (see **Figures 5.10, 5.11 and 5.12.** above, and Appendix 1 of the Heritage Impact Assessment).

As such, the proposed BESS development is unlikely to negatively impact significant palaeontological heritage resources.

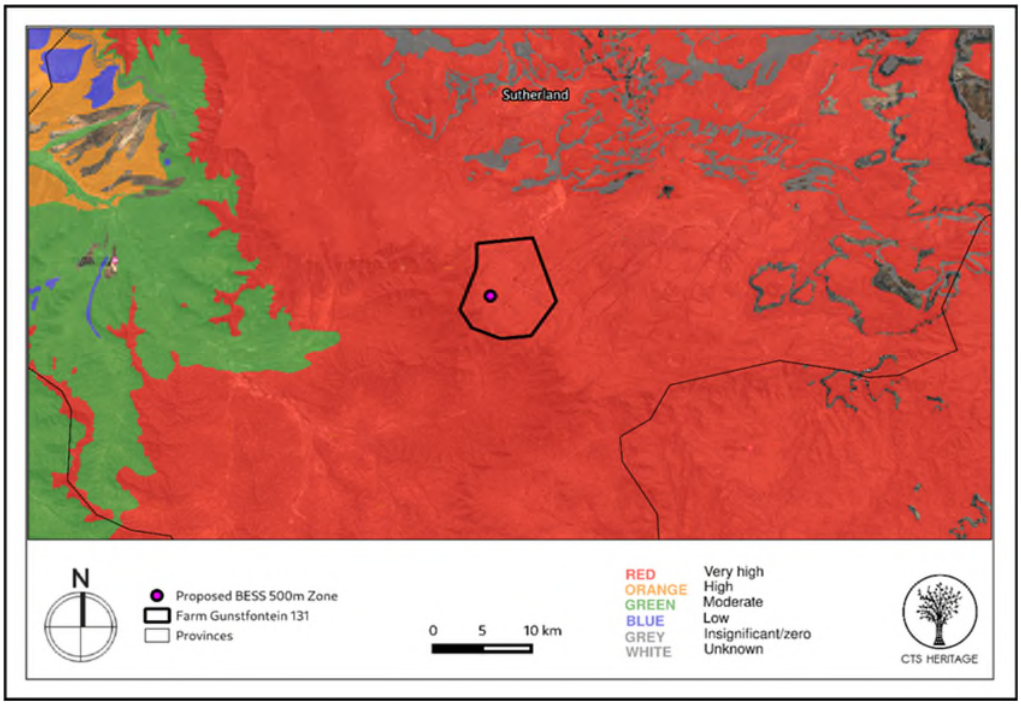

Figure 5.13: Palaeosensitivity Map. Indicating fossil sensitivity underlying the study area. Please See Appendix 3 of the Heritage Impact Assessment for a full guide to the legend.

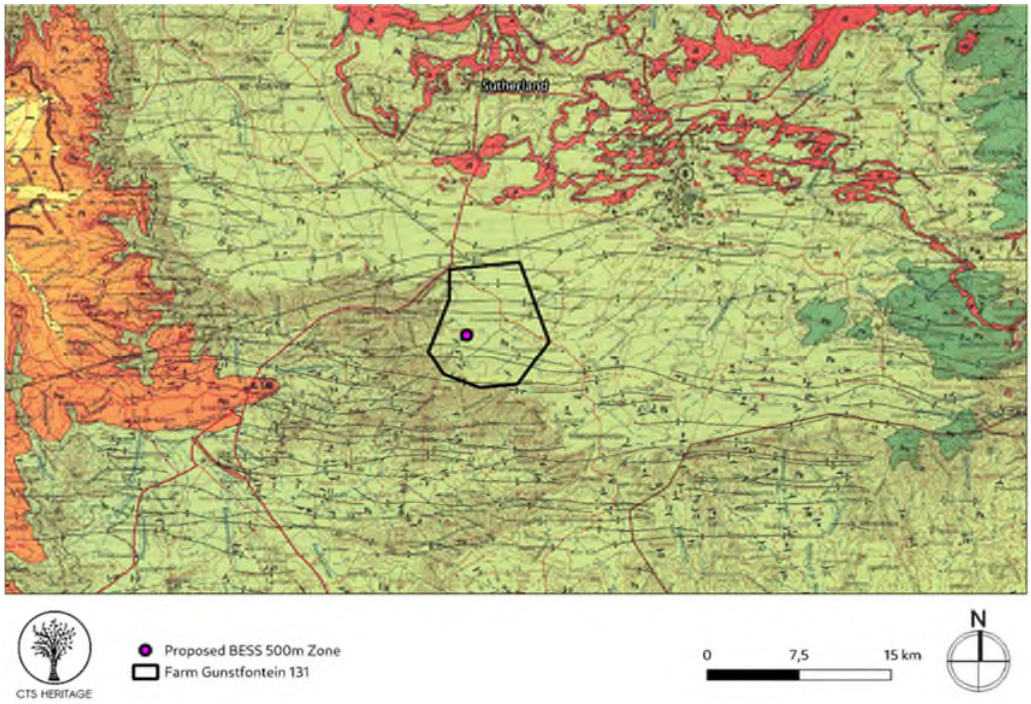

Figure 5.14: Geology Map. Extract from the CGS 3220 Sutherland Map indicating that the development area is underlain by sediments of the Karoo Supergroup assigned to the Beaufort group, within the Abrahamskraal Formation of the Adelaide Subgroup (Pa).

5.8 Agricultural Potential Characteristics of the broader study area and 500m assessment zone surrounding the Gunstfontein Substation

5.8.1. Land capability

The Gunstfontein BESS project assessment zone as well as the area around it includes seven different land capability classes according to the land capability data (DEFF, 2017). Within the project assessment zone, approximately four of these land capability classes are present. The position of the different land capability classes in the landscape are depicted in **Figure 5.15**.

Low-Very Low (Class 04) land capability is present in a diagonal strip along the southwestern boundary. Bordering on this, land with Low (Class 05) and Low-Moderate (Class 06) land capability is present in the largest part of the middle of the project assessment zone. A small area with Low-Moderate (Class 07) land capability is present along the middle of the northern boundary of the assessment zone.

5.8.2. Field crop boundaries

The position of field crops around the proposed Gunstfontein BESS project assessment zone is illustrated in **Figure 5.16**. There are no field crop boundaries within this area. The nearest field crops are approximately

3km away to the northeast of the project area. According to the data set, these fields consist of a small block of horticultural crops and another one of either planted pastures or rainfed crop production (DEFF, 2019). More field crop boundaries are present further away (approximately 9km northeast as well as 9km southwest) from the project assessment zone. Small isolated areas with crop fields are also present further north of the site, in closer proximity to Sutherland. The crop field boundaries outside of the project assessment zone are clustered together and likely represent valleys with deeper and more fertile soil where crops can be produced.

5.8.3. Grazing capacity

The ideal grazing capacity of a specified area is an indication of the long-term production potential of the vegetation layer growing there to maintain an animal with an average weight of 450 kg (defined as 1 Large Stock Unit (LSU)) with an average feed intake of 10 kg dry mass per day over the period of approximately a year. This definition includes the condition that this feed consumption should also prevent the degradation of the soil and the vegetation. The grazing capacity is therefore expressed in a number of hectares per LSU (ha/LSU) (South Africa, 2018). This unit used for large animals such as cattle can be converted to small animal units or small stock units (SSU). The conversion factor is 4 small stock units that equates one large stock unit. Small stock units are more applicable in areas where sheep and goat farming is a more sustainably type of livestock farming.

Following the metadata layer obtained from DEFF, the grazing capacity of the entire project assessment zone, is 32ha/LSU (Error! Reference source not found.**.17**). This can be converted to approximately 8 ha/SSU, depending on the veld quality of the specific area. The project footprint of up to 4 ha will therefore result in the loss of grazing veld of less than 1 head of sheep or goat (small stock unit). Although it is unlikely that cattle farming is present in the area, the area that will be affected provides an eighth (8^{th}) of the feed requirements of one head of cattle.

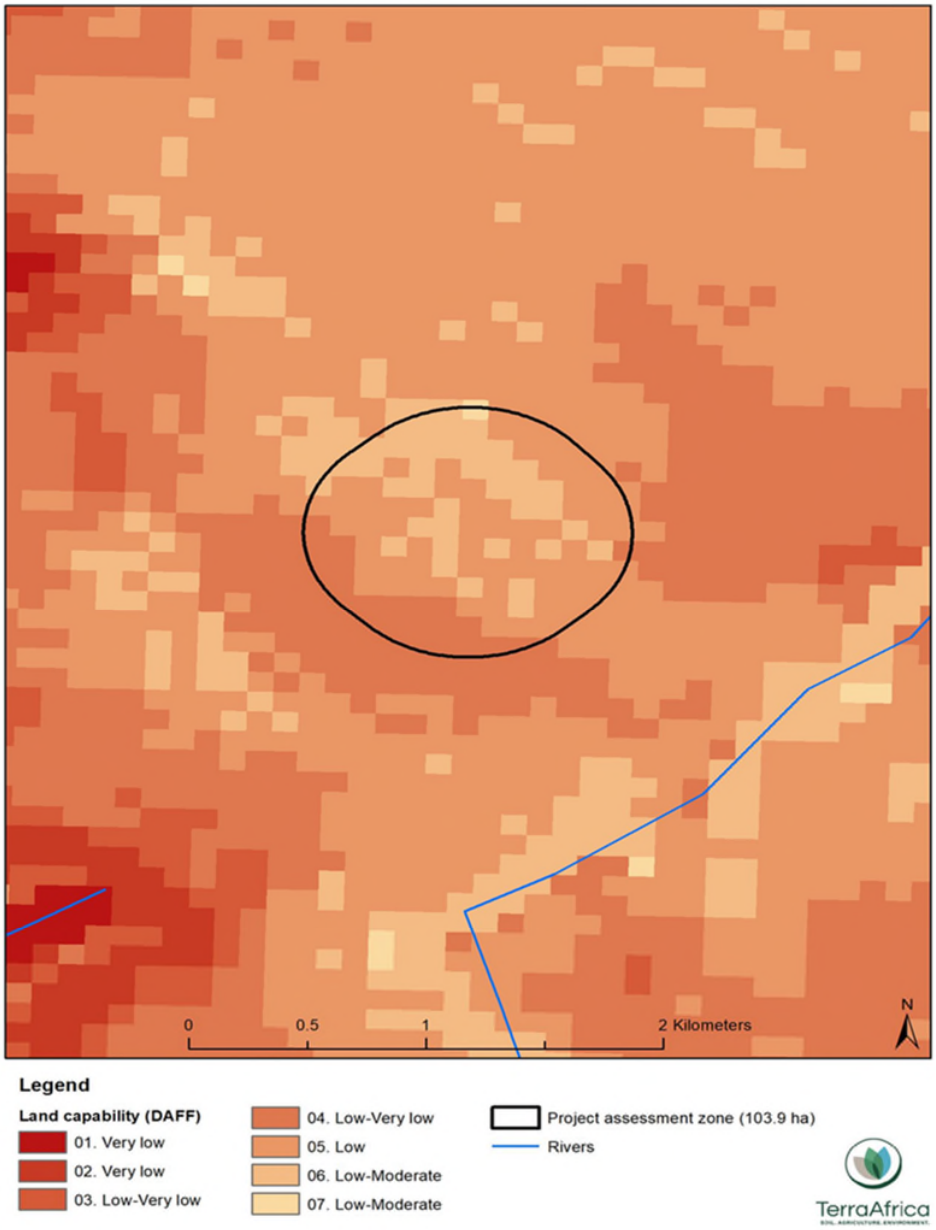

Figure 5.15: Land capability classification of the Gunstfontein BESS project assessment zone and surrounding area (data source: DEFF, 2017) (*As a result of the projection/CRS used to create this map, the assessment zone may appear different to the other maps)*

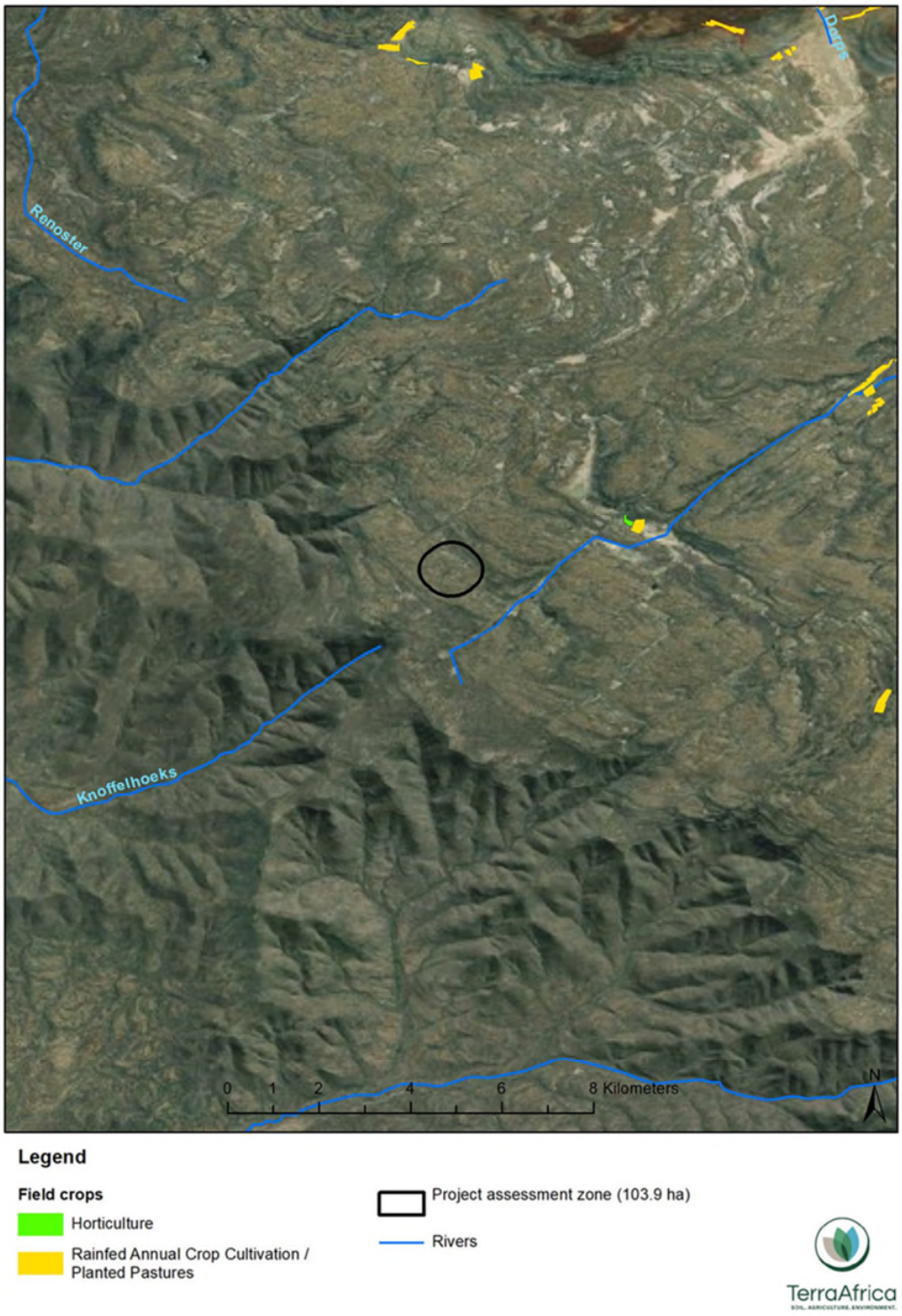

Figure 5.16: Location of field crop boundaries in the larger area around the proposed Gunstfontein BESS project assessment zone (data source: DEFF, 2019)

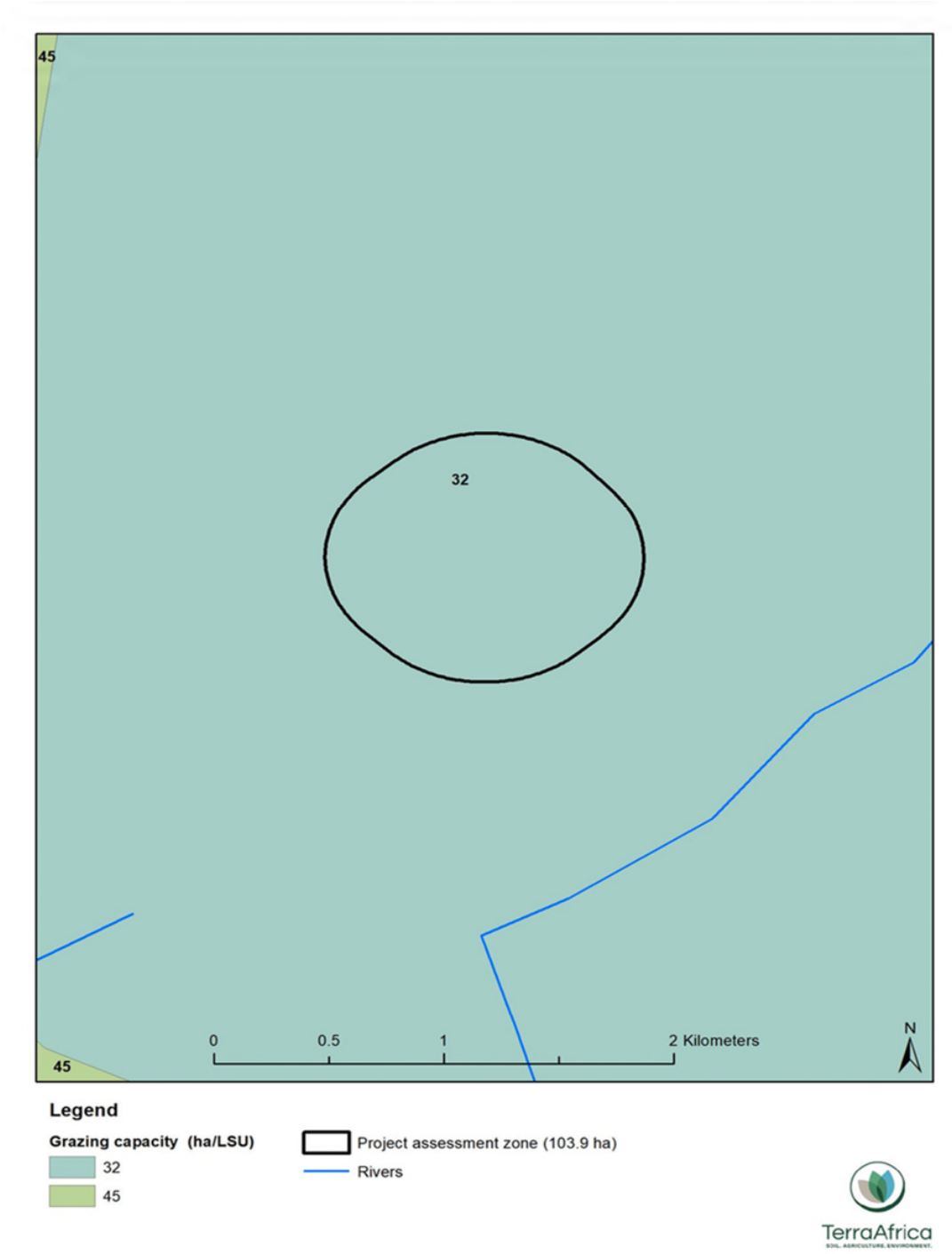

Figure 5.17: Grazing capacity in the larger area around the proposed Gunstfontein BESS project assessment zone (data source: DEFF, 2019)

5.8.4. Land types

The proposed Gunstfontein BESS project assessment zone consists of three different land types. These land types are Fc254 (western part of the assessment zone), Fc256 and Db6 (a smallish section in the northern part of the assessment zone) (**Figure 5.18**). The terrain units, slope and soil forms within each land type is described below.

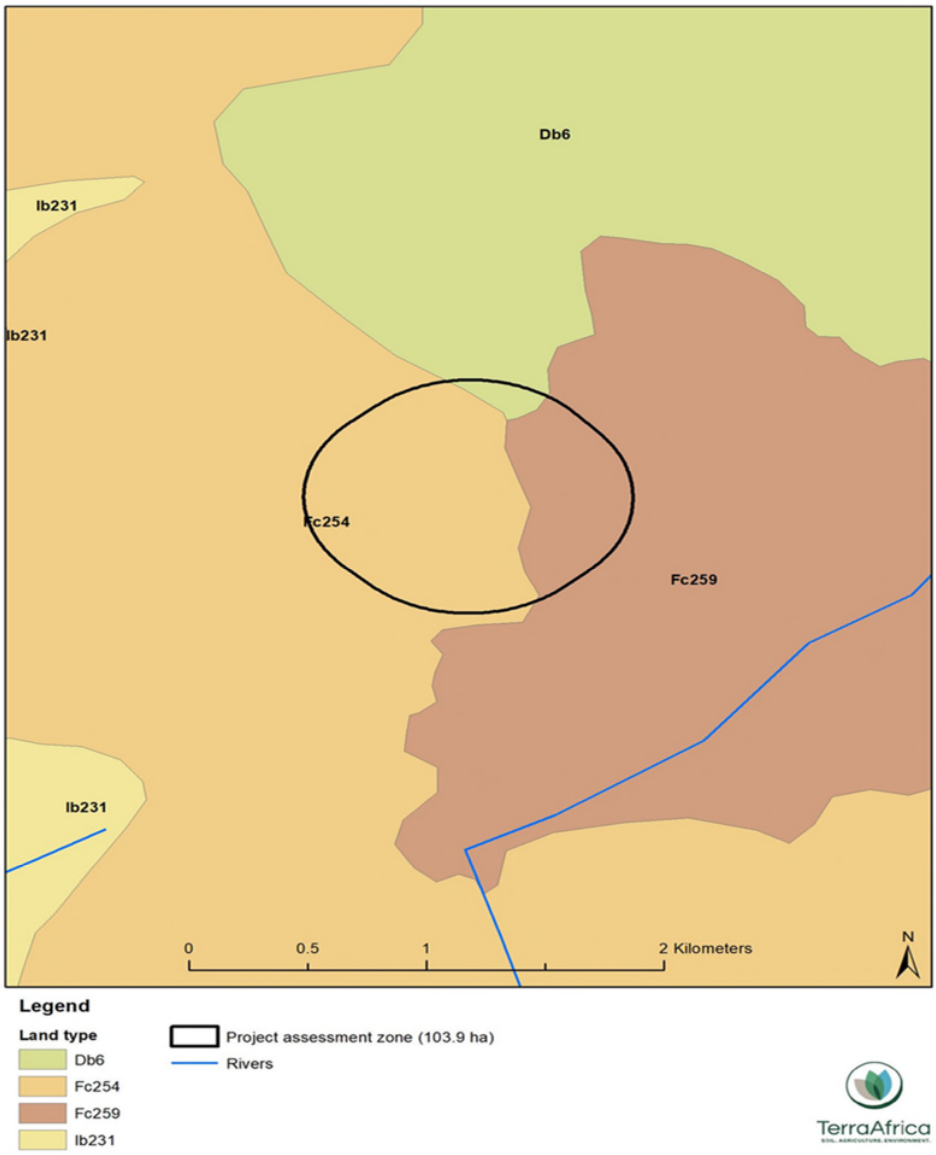

Figure 5.18: Land type classification of the proposed Gunstfontein BESS project assessment zone and the surrounding area.

Land Type Fc254

According to the Land Type Fc254 data sheet, approximately 25440ha of land in South Africa consist of this land type. This area has very limited agricultural potential and only around 0.12% of land within this land type, is considered suitable for arable agriculture. The most prevalent terrain unit within this area, is the toe-slope positions (approximately 60% of the land type area's surface). These areas have slight slope (between 1 and 5%) and consist of a mixture of shallow, rocky Mispah and Glenrosa soils as well as solid rock. Approximately 15% of the toe-slopes as well as 65% of the small depressions (Terrain unit 5) consist of deeper profiles of the Oakleaf form (between 0.3m and deeper than 1.2m). Small area of this land type may consist of soil of the Swartland and Dundee forms.

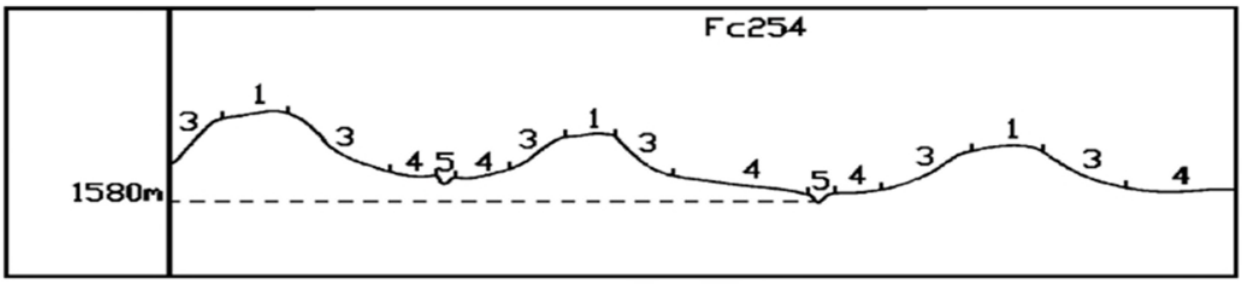

Figure 5.19: Terrain form sketch of Land Type Fc254

Land Type Fc259

Land Type Ib228 consists of four different terrain units (**Figure 5.20**). Approximately 69% of the total land type area occupied by foot-slopes (Terrain unit 4) with slight slope (2 to 5%). The soil forms of this terrain unit are a combination of rock and shallow Mispah and Glenrosa profiles. The crest (Terrain unit 1) and mid-slopes (Terrain unit 3) also consist of the same combination of shallow soils. Deeper soil profiles of the Oakleaf and Dundee forms may be found in small depressions in this area (Terrain unit 5). Land Type Ib228 are not considered suitable for arable agriculture. The land type data sheet indicate that of the estimated total area of 3922ha occupied by this land type in South Africa, none of this area have suitability for arable crop production.

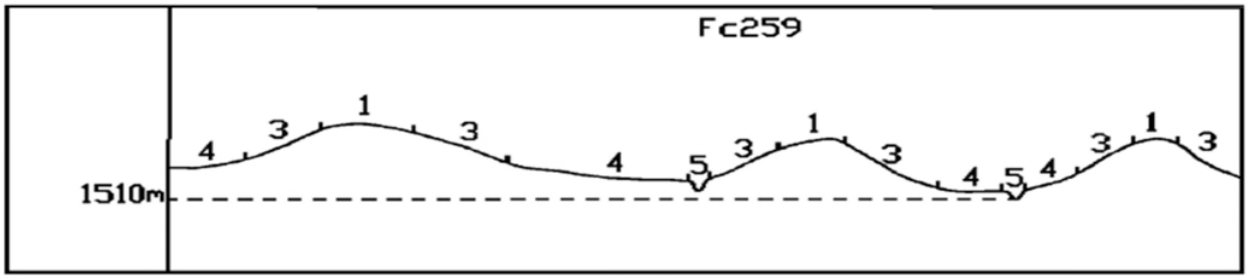

Figure 5.20: Terrain form sketch of Land Type Fc259

Land Type Db6

Around 7215ha of land in the country consist of Land Type Db6 and of this area, only 25ha is considered suitable for arable agriculture. This land type consists of only two terrain units i.e. flat to slightly sloped toe-

slopes (Terrain unit 4) where slope ranges between 0 and 2% as well as small depressions in the landscape (Terrain unit 5) (**Figure 5.21**). Both the toe-slopes and small depressions consist largely of shallow soil profiles with moderate to strong structured soil (Swartland form). Other soil forms within this land type include that of the Mispah, Glenrosa and Oakleaf forms as well as around 10% solid rock.

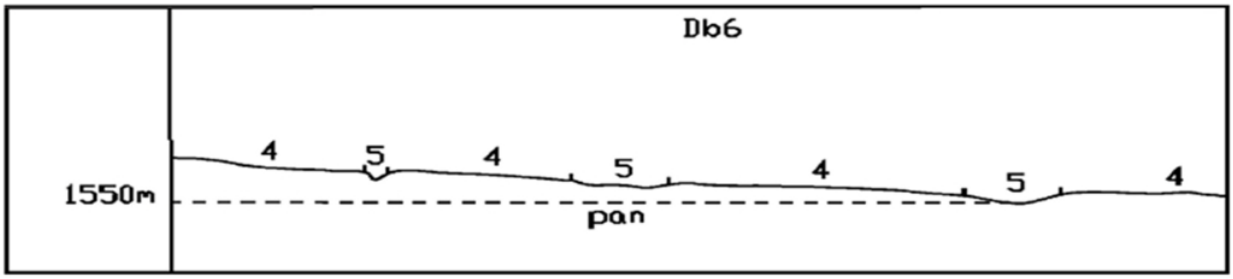

Figure 5.21: Terrain form sketch of Land Type Db6

5.8.5. Soil forms

According to the land type data, the most likely soil forms that are present within the project assessment zone is the Mispah and Glenrosa soils as well as solid rock. Within this area, toe-slopes and depressions in the landscape will likely consist of soil of the Oakleaf, Swartland and Dundee forms. Since the land type data sheets were compiled, the South African Soil Classification System was updated to provide for the wider range of soil forms that have been identified since the publication of the soil system classification guidelines in 1991. Following the new classification system (Soil Classification Working Group, 2018), the main soil forms identified in the area, are thoseof the Mispah, Glenrosa, Bethesda, Tubatse, Swartland, Spioenberg and Dundee forms.

Figure 5.22: Photographic evidence of a shallow Bethesda form identified on site (the neocutanic subsoil horizon is limited in depth by fractured rock)

Soil of the Spioenberg form was identified in the northern part of the project assessment zone. The Spioenberg form consist of orthic topsoil underlain by a pedocutanic horizon that reaches to a depth of 0.5m (**Figure 5.23**). The pedocutanic horizon has moderate to strong blocky structure. The effective depth of

the pedocutanic horizon is limited by fractured rock. The orthic topsoil has bleached colours while the subsoil horizon is brown with vertic colours and non-calcareous.

Figure 5.23: Photographic evidence of the Spioenberg profile present within the project assessment zone

5.8.6. Land Use and Agricultural Activities

The current land use the land parcel assessed, is a combination of natural veld that support local biodiversity and small stock farming. The natural vegetation consist of small shrubs and veld grass between the shrubs and forbs are sparse, especially during times of drought (**Figure 5.24** and **Figure 5.25 Error! Reference source not found.**).

Figure 5.24: Sparse vegetation consisting of small shrubs and forbs with the sandy topsoil surface of the Dundee profiles visible

Figure 5.25: Fractured rock visible on the surface of the shallow Mispah and Glenrosa profiles in the toe-slope positions of Land Type Fc254

In confirmation of the field crop data layer for the Northern Cape (DEFF, 2019), the project assessment zone has no rainfed or irrigated crop fields. No special horticultural structures such as tunnels or greenhouses are present within this area.

CHAPTER 6: ASSESSMENT OF IMPACTS

This chapter serves to assess the significance of the positive and negative environmental impacts (direct and indirect) expected for the proposed BESS and associated infrastructure.

The full extent of the BESS and associated infrastructure was considered, through the specialist assessments undertaken as part of this BA process, as well as within this impact assessment report. A 500m assessment zone was placed and assessed around the authorised Gunstfontein WEF Substation to microsite the BESS within this zone. During the final micro-siting, the BESS and associated infrastructure will be appropriately sited within the assessment zone through the consideration of the sensitive environmental features present, with avoidance of the features considered to be the preferred option.

The development of the BESS and associated infrastructure for the Gunstfontein Wind Energy Facility will comprise the following phases:

» ***Pre-Construction and Construction*** – will include pre-construction surveys; site preparation; establishment of access roads (where required), laydown area; construction of foundations involving excavations; the transportation of components/construction equipment to site, manoeuvring and operating vehicles for unloading and installation of equipment; and commissioning of new equipment and site rehabilitation. The construction phase for the BESS and associated infrastructure is estimated to be up to 12 months.

» ***Operation*** – will include the operation of the BESS and associated infrastructure, which will enable the storage of electricity from the Gunstfontein Wind Farm for evacuation into the national grid at times when the Gunstfontein Wind Energy Facility is not generating energy. The operation phase of the BESS and associated infrastructure is expected to be at least 20 years. Regular and ad hoc maintenance will take place during the operational phase as needed to ensure continual, optimal operation of the BESS infrastructure.

» ***Decommissioning*** – depending on the economic viability of the Gunstfontein Wind Energy Facility, the length of the operation phase may be extended beyond a 20 year period. At the end of the project's life, decommissioning will include site preparation, disassembling of the components of the BESS and associated infrastructure, clearance of the relevant infrastructure within the BESS footprint, removal of all components from site and rehabilitation. **Note:** that impacts associated with decommissioning are expected to be similar to those associated with construction activities. However, in some instances some specialists have identified and assessed specific decommissioning impacts associated with the project, these impacts are assessed as separate impact tables where relevant below.

Environmental issues associated with construction, operational and decommissioning activities may include, among others, threats to biodiversity and ecological processes, including habitat alteration and impacts to fauna and flora, impacts to sites of heritage value, soil erosion and contamination of water and soils associated with spillages of hazardous materials and inappropriate storage, handling and disposal of waste.

6.1. Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report

This chapter of the BA Report includes the following information required in terms of Appendix 1: Content of BA Reports:

Requirement	Relevant Section
3(h)(v) the impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts (aa) can be reversed, (bb) July cause irreplaceable loss of resources, and (cc) can be avoided, managed or mitigated.	The impacts and risk associated with the development of the BESS and associated infrastructure , including the nature, significance, consequence, extent, duration and probability of the impacts and the degree to which the impact can be reversed and cause an irreplaceable loss of resources are included in sections 6.3, 6.4, 6.5, 6.6, 6.7
3(h)(vii) positive and negative impacts that the proposed activity will have on the environment and on the community that July be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects	The positive and negative impacts associated with the development of the BESS and associated infrastructure are included in sections 6.3, 6.4, 6.5, 6.6, 6.7
3(h)(viii) the possible mitigation measures that could be applied and the level of residual risk.	The mitigation measures that can be applied to the impacts associated with the development of the BESS and associated infrastructure are included in sections 6.3, 6.4, 6.5, 6.6, 6.7
3(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures,.	A description of all environmental impacts identified for the development of the BESS and associated infrastructure during the BA process, and the extent to which the impact significance can be reduced through the implementation of the recommended mitigation measures provided by the specialists are included in sections 6.3, 6.4, 6.5, 6.6, 6.7
3(j) an assessment of each identified potentially significant impact and risk, including (i) cumulative impacts, (ii) the nature, significance and consequences of the impact and risk, (iii) the extent and duration of the impact and risk, (iv) the probability of the impact and risk occurring, (v) the degree to which the impact and risk can be reversed, (vi) the degree to which the impact and risk July cause irreplaceable loss of resources and, (vii) the degree to which the impact and risk can be avoided, managed or mitigated.	An assessment of each impact associated with the development of the BESS and associated infrastructure, including the nature and significance, the extent and duration, the probability, the reversibility, and the potential loss of irreplaceable resources, as well as the degree to which the significance of the impacts can be mitigated are included in sections 6.3, 6.4, 6.5, 6.6, 6.7
3(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr.	Mitigation measures recommended by the various specialists for the reduction of the impact significance are included in sections 6.3, 6.4, 6.5, 6.6, 6.7.

6.2. Quantification of Areas of Disturbance within the BESS 500m Assessment Zone

Site-specific impacts associated with the construction, operation and potential decommissioning of the BESS and associated infrastructure for the Gunstfontein Wind Energy Facility relate to the direct loss of vegetation and species of special concern, disturbance of animals (including avifauna) and loss of habitat and impacts on soils. In order to assess the impacts associated with the development of the BESS and associated infrastructure, it is necessary to understand the extent of the affected BESS and associated infrastructure and the development footprint of the infrastructure proposed to be developed within the 500m assessment zone. In this regard, the following is relevant:

- The BESS will be up to 4ha in extent and will be located near to the authorised Gunstfontein Wind Farm substation.
- MV cabling (33kV or less) will connect the BESS to the substation. The Cabling may be above- or below-ground.
- An access road to the BESS (6m in width with 1m drainage on each side of the road, with a maximum length of 500m) branching off of the authorised WEF roads).
- A temporary laydown area located within the ~4ha BESS development area
- Fire breaks around the perimeter of the BESS (in which vegetation will be trimmed).

Based on the above, a development footprint of no more than 5ha is relevant for the BESS development and associated infrastructure. This footprint will be appropriately located within the 500m development zone assessed within this section of the report.

6.4. Assessment of impacts of Ecology

6.4.1. Ecological Site Sensitivity Assessment

The sensitivity map for the BESS 500m assessment region is illustrated below in **Figure 6.1**. The majority of the 500m assessment region is typical, open plains Roggeveld Shale Renosterveld, considered to be low ecological sensitivity. There is however one minor drainage line within the BESS 500m assessment region that is considered to be high ecological sensitivity and unsuitable for development. There are also some areas of rock pavement distributed across the site which are considered medium sensitivity on account of the value of these areas as faunal habitat. Under the layout of the BESS provided for this assessment, the BESS would be restricted to the low sensitivity parts of the site, with the result that the impacts associated with the BESS would be low. Provided that the BESS footprint can be restricted to the low and/or medium sensitivity areas within the 500m assessment zone, the exact placement of the BESS within this area would not result in significant differences in impact. As such, the current placement is considered acceptable but alternative placements within the medium and low sensitivity areas would also be acceptable.

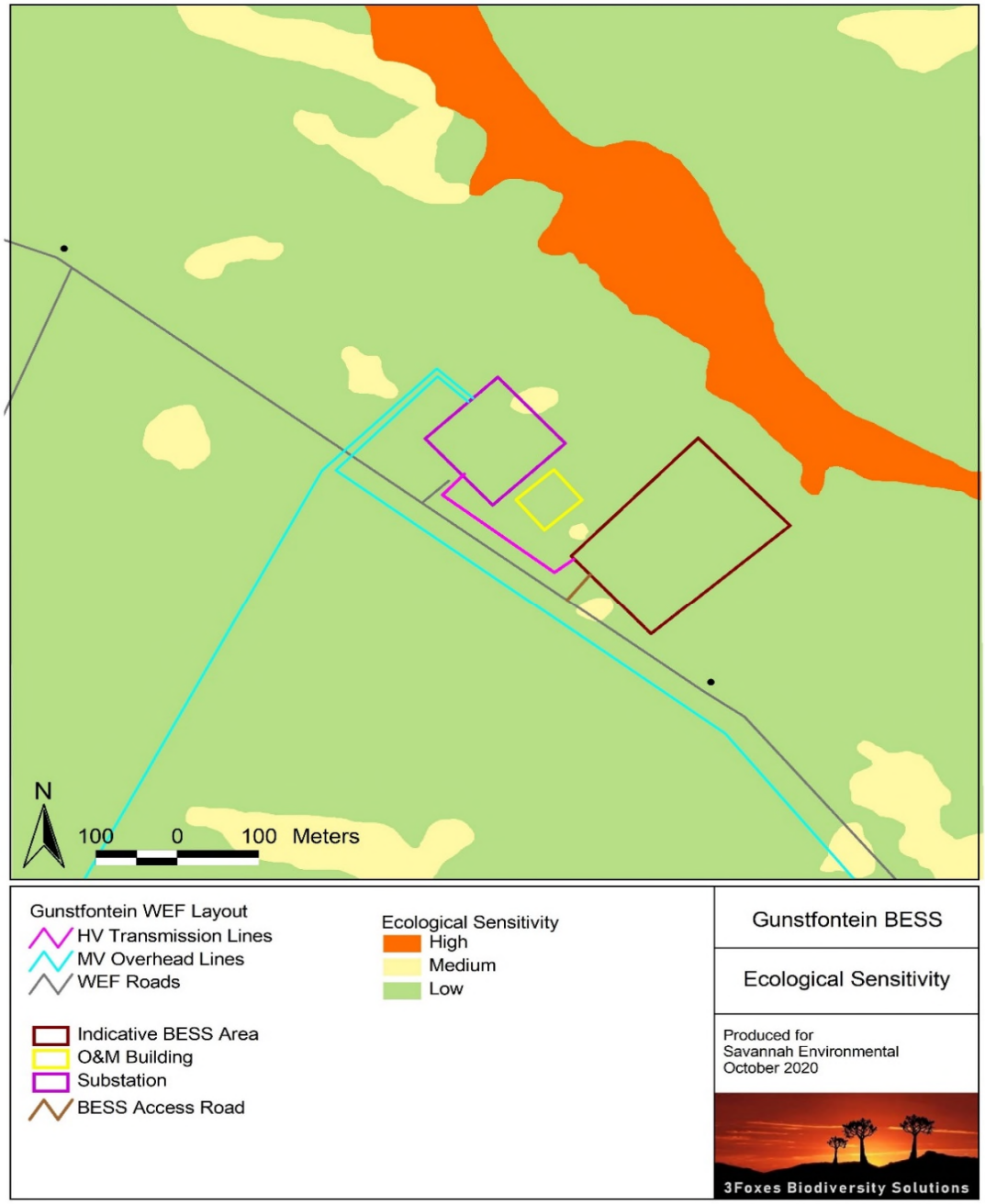

Figure 6.1: Sensitivity map for the Gunstfontein BESS 500m assessment region.

6.4.2. Identification of Impacts

» *Impacts on vegetation and protected plant species:*
Several protected species occur in the area and which would potentially be impacted by the development of the Gunstfontein BESS. Vegetation clearing during the construction phase will lead to the loss of currently intact habitat within the footprint and is an inevitable consequence of the establishment of the BESS. As this impact is certain to occur during the construction phase, it is assessed

for the construction phase only, as this is when the impact will occur, although the consequences will persist for some time after construction has been completed.

» *Direct faunal impacts*
Increased levels of noise, pollution, disturbance and human presence during the construction phase will be detrimental to fauna. Sensitive and shy fauna would move away from the development area during the construction phase as a result of the noise and human activities present, while some slow-moving species would not be able to avoid the construction activities and might be killed. Some impact on fauna is highly likely to occur during the construction phase and this impact is therefore assessed for the construction phase only.

» *Direct Avifaunal impacts*
Vegetation clearing for the BESS and associated infrastructure will impact the local avifauna directly through habitat loss. The presence and operation of construction machinery on site would create a physical impact as well as generate noise, pollution and other forms of disturbance, while increased human presence could lead to poaching, illegal fauna collecting and other forms of disturbance such as fire. Impacts on avifauna during the operational phase would be reduced and the operation of the BESS would generate minor disturbance during maintenance of infrastructure, which may deter some avifauna from the area, especially red-listed avifaunal species which are less tolerant of disturbances. Should the connection between the BESS and the substation require an overhead line, there would be a small risk of collisions with the power line and electrocution from the power line infrastructure (Lehman et al., 2007, Jenkins et al., 2010).

» *Habitat Degradation due to Erosion and Alien Plant Invasion*
Disturbance within and near the BESS site generated during the construction phase will leave the area vulnerable to erosion and alien plant invasion, which would lead to degradation of the local environment. Although, the disturbance would be created during the construction phase, the major impacts would manifest during the operation phase.

» *Impact on CBAs and NPAES Focus Areas*
The development would have an impact on an area classified as CBA 1. However, the BESS is not within an NC-PAES Focus Area, indicating that it has not been identified as being of high significance for future conservation expansion. The impact on the CBAs is assessed as part of the cumulative impacts associated with the development.

6.4.3. Assessment of Impacts

The various identified impacts are assessed below for the different phases of the development.

Planning & Construction Phase

Impact 1. Impacts on vegetation and listed or protected plant species resulting from the BESS construction activities

Impact Nature: Impacts on vegetation will occur due to disturbance and vegetation clearing associated with the construction of the BESS and associated infrastructure.

	Without Mitigation	**With Mitigation**
Extent	Local (1)	Local (1)
Duration	Long-term (3)	Long-term (3)
Magnitude	Low (3)	Low (2)
Probability	Highly Likely (4)	Highly Likely (4)
Significance	Low (28)	Low (24)
Status	Negative	Negative
Reversibility	Moderate	Moderate
Irreplaceable loss of resources	Low	Low
Can impacts be mitigated?	This impact cannot be well mitigated because some loss of vegetation is unavoidable and is a certain outcome of the development.	
Mitigation	• Pre-construction walk-through of the final layout in order to locate species of conservation concern that can be translocated as well as comply with the Northern Cape Nature Conservation Act and Northern Cape Department of Agriculture, Environmental Affairs, Rural Development and Land Reform/DAFF permit conditions. • Search and rescue for identified species of concern before construction. • Vegetation clearing to commence only after walk-through has been conducted and necessary permits obtained. • Pre-construction environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. This includes awareness of no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimising wildlife interactions, remaining within demarcated construction areas etc. • Environmental Officer (EO) to provide supervision and oversight of vegetation clearing activities within sensitive areas such as near the drainage lines and wetlands. • Vegetation clearing should be kept to a minimum and restricted to the BESS footprint as closely as possible. • All construction vehicles should adhere to clearly defined and demarcated roads. No off-road driving to be allowed outside of the construction area. • Temporary laydown areas should be located within previously transformed areas or areas that have been identified as being of low sensitivity. These areas should be rehabilitated after use.	
Cumulative Impacts	The Gunstfontein BESS will contribute to cumulative impacts on habitat loss and transformation in the area, but the contribution would be very low.	
Residual Risks	The loss of currently intact vegetation is an unavoidable consequence of the development and cannot be entirely mitigated. The residual impact would however be low.	

Impact 2. Direct Faunal Impacts Due to Construction Activities

Impact Nature: Disturbance, transformation and loss of habitat will have a negative effect on resident fauna during construction. This will however be transient and restricted to the construction phase.		
	Without Mitigation	**With Mitigation**
Extent	Local (1)	Local (1)
Duration	Short-term (2)	Short-term (2)
Magnitude	Low (3)	Low (2)
Probability	Probable (3)	Probable (3)
Significance	Low (18)	Low (15)
Status	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources	No	No
Can impacts be mitigated?	Partly, although noise and disturbance cannot be well mitigated, impacts on fauna due to human presence such as poaching can be mitigated.	
Mitigation	• All personnel should undergo environmental induction with regards to fauna and, in particular, awareness about not harming or collecting species such as snakes, tortoises and owls, which are often persecuted out of superstition. • Any fauna threatened by the construction activities should be removed to safety by an appropriately qualified environmental officer. • All construction vehicles should adhere to a low speed limit on site (40km/h max) to avoid collisions with susceptible species such as snakes and tortoises. • All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. • If holes or trenches need to be dug for electrical cabling or other facility infrastructure, these should not be left open for extended periods of time as fauna may fall in and become trapped in them. Holes should only be dug when they are required and should be used and filled shortly thereafter.	
Cumulative Impacts	During the construction phase the activity would contribute to cumulative fauna disturbance and disruption in the area, but this would be short lived and little long-term impact would be generated.	
Residual Risks	It is probable that some individuals of susceptible species will be lost to construction-related activities despite mitigation. However, this is not likely to impact the viability of the local population of any fauna species.	

Impact 3. Avifaunal Impact due to Construction Activities

Impact Nature: Direct Avifaunal Impacts During Construction – habitat loss and disturbance		
	Without Mitigation	**With Mitigation**

Extent	Local (1)	Local (1)
Duration	Short-term (1)	Short-term (1)
Magnitude	Low to Moderate (4)	Low (3)
Probability	Highly likely (4)	Probable (3)
Significance	Low (24)	Low (15)
Status	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources	Low	Low
Can impacts be mitigated?	Although there will be some habitat loss that cannot be well mitigated, impacts on avifauna will be transient and of low magnitude during construction.	
Mitigation	• If the connection to the substation is an overhead line then the design of the proposed power line must be of a type or similar structure as endorsed by the Eskom-EWT Strategic Partnership on Birds and Energy, taking into account the mitigation guidelines recommended by Birdlife South Africa (Jenkins et al., 2017). • Where necessary, deterrent devices such as bird guards should be mounted on relevant parts of the pylons to further reduce the possibility of electrocutions. • The power line should be marked with bird diverters in order to make the lines as visible as possible to collision-susceptible species. Recommended bird diverters such as brightly coloured 'aviation' balls, thickened wire spirals, or flapping devices that increase the visibility of the lines should be fitted. • All personnel should undergo environmental induction with regards to avifauna and in particular awareness about not harming, collecting or hunting terrestrial species (e.g. bustards, korhaans, francolin), and owls, which are often persecuted out of superstition. • All construction vehicles should adhere to clearly defined and demarcated roads. No off-road driving to be allowed outside of the construction area. • The use of laydown areas within the footprint of the development should be used where feasible, to avoid habitat loss and disturbance to adjoining areas. • Any avifauna threatened by the construction activities should be removed to safety by the Environmental Officer (EO). • If lights are to be used at night for ensuring that infrastructure on site is lit, this should be done with downward-directed low-UV type lights (such as most HPS bulbs), which do not attract insects and their avian predators., so as to minimise disturbance to birds flying over the site at night. • All vehicles (construction or other) accessing the site should adhere to a low speed limit on site (40km/h max) to avoid collisions with susceptible avifauna, such as nocturnal and crepuscular species (e.g.	

	nightjars and owls) which sometimes forage or rest on roads, especially at night. • If holes or trenches need to be dug for cabling or pylons, these should not be left open and unattended for extended periods (> 1 week) of time as terrestrial avifauna or their flightless young may become entrapped therein. Holes should only be dug when they are required and should be used and filled shortly thereafter, alternately, excavated areas should be checked frequently for trapped fauna/ avifauna that require assistance to exit the excavated area.
Cumulative Impacts	The Gunstfontein BESS will contribute to cumulative impacts on avifaunal habitat loss and fragmentation, as well as collision risk with power line infrastructure in the area. However, given the small footprint of the development and proximity to the approved substation, the contribution would be insignificant.
Residual Risks	There would be some residual habitat loss associated with the development that cannot be avoided.

Operational Phase Impacts

Impact 1. Faunal Impacts due to Operation

Impact Nature: The operation and maintenance of the Gunstfontein BESS may lead to disturbance or persecution of fauna in the vicinity of the development.		
	Without Mitigation	**With Mitigation**
Extent	Local (1)	Local (1)
Duration	Long-term (4)	Long-term (4)
Magnitude	Minor (2)	Minor (2)
Probability	Probable (3)	Improbable (2)
Significance	Low (21)	Low (14)
Status	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources	No	No
Can impacts be mitigated?	To a large extent, but some low-level residual impact due to noise and human disturbance may occur during maintenance activities.	
Mitigation	• Any potentially dangerous fauna such as snakes or fauna threatened by the maintenance and operational activities should be removed to a safe location. • All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. • All vehicles accessing the site should adhere to a low speed limit on site (40km/h max) to avoid collisions with susceptible species such as snakes and tortoises.	

Cumulative Impacts	The development would contribute to cumulative disturbance for fauna, but the contribution would be very low and is not considered significant.
Residual Risks	Disturbance from maintenance activities will occur at a low and infrequent level with the result that no long-term impacts are expected to occur.

Impact 2. Avifaunal Impacts due to Operation

Impact Nature: Direct Avifaunal Impacts During Operation – collisions, electrocution and disturbance		
	Without Mitigation	**With Mitigation**
Extent	Local (1)	Local (1)
Duration	Long-term (4)	Long-term (4)
Magnitude	Moderate (4)	Low (3)
Probability	Likely (3)	Improbable (2)
Significance	Low (27)	Low (16)
Status	Negative	Negative
Reversibility	Medium	Medium
Irreplaceable loss of resources	Low	Low
Can impacts be mitigated?	To a large extent, although bird flappers and other bird diverters are not 100% effective in reducing bird collisions and electrocutions, hence there would still be a low residual impact.	
Mitigation	• Any injuries or mortalities of avifauna observed at the BESS should be reported to the EO and recorded for monitoring purposes. Should repeated injuries or fatalities occur, an avifaunal expert should be consulted to identify and remedy the cause of the problem. • movements by vehicles and personnel should remain within the BESS and substation area and should not stray from the approved access and maintenance routes. • Any raptor nests that are discovered on the power line structures should be reported to the Environmental Officer, while utmost care should be taken to not disturb these nests during routine maintenance procedures.	
Cumulative Impacts	The development will contribute to cumulative impacts on avifaunal habitat loss as well as collision and electrocution risk with power line infrastructure in the area, but given the extent of the development, the contribution would be minimal.	
Residual Risks	Deterrent devices such as bird guards to reduce electrocutions, and flight diverters to reduce the risk of collisions with power lines are not 100% effective and some residual impact is likely to occur.	

Impact 3. Habitat Degradation due to Erosion and Alien Plant Invasion

Impact Nature: Disturbance created during the construction phase will leave the site and immediate surroundings vulnerable to erosion and alien plant invasion for several years into the operation phase.		
	Without Mitigation	**With Mitigation**
Extent	Local (1)	Local (1)

Duration	Medium-term (2)	Long-term (3)
Magnitude	Medium Low (3)	Minor (2)
Probability	Probable (3)	Improbable (2)
Significance	Low (18)	Low (12)
Status	Negative	Negative
Reversibility	Medium	High
Irreplaceable loss of resources	Low	Low
Can impacts be mitigated?	Yes, with proper management and avoidance, this impact can be mitigated to a low level.	
Mitigation	• Erosion management within the development area should take place according to the Erosion Management Plan and Rehabilitation Plan of the project. • The site access road should have run-off control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk. • Regular monitoring for erosion during operation to ensure that no erosion problems have developed as a result of the disturbance, as per the Erosion Management and Rehabilitation Plans for the project. • All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. • There should be follow-up rehabilitation and re-vegetation of any remaining bare areas with indigenous perennial shrubs and succulents from the local area. • Alien management at the site should take place in accordance with the Alien Invasive Management Plan of the project. • Regular monitoring for alien plant proliferation during the operation phase to ensure that no alien invasion problems have developed as result of the disturbance, as per the Alien Invasive Management Plan for the project. • If required, woody alien plant species should be controlled on at least an annual basis using the appropriate alien control techniques as determined by the species present.	
Cumulative Impacts	Erosion and alien plant invasion would contribute to degradation in the area, but as this can be well-mitigated, the contribution can be minimised.	
Residual Risks	Some erosion and alien plant invasion is likely to occur even with the implementation of control measures, but would have a low impact.	

Decommissioning Phase

Decommissioning Phase Impact 1. Habitat Degradation due to Erosion and Alien Plant Invasion

Impact Nature: Disturbance created during decommissioning will leave the development area vulnerable to erosion and alien plant invasion for several years.		
	Without Mitigation	**With Mitigation**
Extent	Local (1)	Local (1)

Duration	Long-term (4)	Long-term (3)
Magnitude	Medium (3)	Minor (2)
Probability	Probable (3)	Improbable (2)
Significance	Low (24)	Low (12)
Status	Negative	Negative
Reversibility	Low	High
Irreplaceable loss of resources	Moderate	Low
Can impacts be mitigated?	Yes, with proper management and avoidance, this impact can be mitigated to a low level.	
Mitigation	• Erosion management within the development area should take place in accordance with the Erosion Management and Rehabilitation Plan of the project. • All erosion problems observed should be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. • There should be follow-up rehabilitation and revegetation of any remaining bare areas with indigenous perennial shrubs, grasses and trees from the local area. • Alien management at the site should take place according to the Alien Invasive Management Plan. This should make provision for alien monitoring and management annually for at least 3 years after decommissioning. Woody aliens should be controlled using the appropriate alien control techniques as determined by the species present. This might include use of herbicides where no practical manual means are feasible.	
Cumulative Impacts	Erosion and alien plant invasion would contribute to degradation in the area, but as this can be well-mitigated, the contribution can be minimised.	
Residual Risks	Some erosion and alien plant invasion is likely to occur even with the implementation of control measures, but would have a low impact if effectively managed.	

Decommissioning Phase Impact 2. Direct Faunal Impacts Due to Decommissioning Activities

Impact Nature: Due to disturbance, noise and the operation of heavy machinery, faunal disturbance due to decommissioning will extend beyond the footprint and impact adjacent areas to some degree. This will however be transient and restricted to the period while machinery is operational. In the long term, decommissioning should restore the ecological functioning and at least some habitat value to the affected areas.		
	Without Mitigation	**With Mitigation**
Extent	Local (1)	Local (1)
Duration	Short-term (1)	Short-term (1)
Magnitude	Low (4)	Minor (3)
Probability	Probable (3)	Probable (3)

Significance	Low (18)	Low (15)
Status	Negative	Negative
Reversibility	Moderate	Moderate
Irreplaceable loss of resources	No	No
Can impacts be mitigated?	Although the noise and disturbance generated at the site during decommissioning is probably largely unavoidable, this will be transient and ultimately the habitat should be restored to something useable by the local fauna.	
Mitigation	• All personnel should undergo environmental induction with regards to fauna and, in particular, awareness about not harming or collecting species such as snakes, tortoises and owls, which are often persecuted out of superstition. • Any fauna threatened by the decommissioning activities should be removed to safety by an appropriately qualified environmental officer. • All vehicles should adhere to a low speed limit on site (30km/h for heavy vehicles and 40km/h for light vehicles) to avoid collisions with susceptible species such as snakes and tortoises. • All hazardous materials should be stored in the appropriate manner to prevent contamination of the site and ultimately removed from the site as part of decommissioning. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. • The site should be rehabilitated with locally occurring species to restore ecosystem structure and function.	
Cumulative Impacts	During the decommissioning, the associated disturbance would contribute to cumulative fauna disturbance and disruption in the area, but this would be transient and not of long-term impact.	
Residual Risks	Although some components of disturbance cannot be avoided, the site itself would have low faunal abundance at decommissioning and no significant residual impacts are likely.	

6.4.4. Implications for Project Implementation

From the findings of the Ecological Impact Assessment it can be concluded that there are no major implications associated with the establishment of Gunstfontein BESS, and where there are these can be mitigated to a low significance. Although cumulative impacts in the area are a concern due to the high density of wind energy developments in the area, the contribution of the Gunstfontein BESS would be low and is not considered to be of significance. Based on the preliminary layout provided for the assessment, and the 500m assessment region, the Gunstfontein BESS can be supported from a terrestrial ecology point of view provided it is located within areas of moderate or low ecological sensitivity within the 500m assessment region.

6.5. Assessment of Impacts on Heritage Resources

Based on the information available from heritage assessments previously conducted in the area proposed for development, the proposed development of the BESS within the Gunstfontein WEF is unlikely to negatively impact significant archaeological, built environment and palaeontological heritage as long as the recommendations contained in Booth (2012) and Rossouw (2012), and repeated below, are implemented. From a heritage perspective, the proposed BESS can be located anywhere within the 500m area assessed in this screening assessment

Impact Nature: Archaeological and built environment heritage resources may be impacted by the construction phase of the proposed development		
	With Mitigation	**Without Mitigation**
Extent	(Low 1) Localised within the site boundary	(Low 1) Localised within the site boundary
Duration	(High 5) Where manifest, the impact will be permanent.	(High 5) Where manifest, the impact will be permanent.
Magnitude	(Low 1) No significant archaeological resources have been identified in proximity to the proposed BESS.	Low 1) No significant archaeological resources have been identified in proximity to the proposed BESS.
Probability	(Low 1) Probability is low	(Low 1) Probability is low
Significance	**(Low 1) (1+5+1)x1=7**	**(Low 1) (1+5+1)x1=7**
Status	Neutral	Neutral
Reversibility	(Low 1) Any impacts to heritage resources that do occur are irreversible	(Low 1) Any impacts to heritage resources that do occur are irreversible
Irreplaceable loss of resources	(Low 1) Possible	(Low 1) Possible
Can impacts be mitigated?	Yes	Yes
Mitigation » A walk-down of the proposed BESS area is required prior to construction. This must be conducted by a qualified archaeologist to ensure that no heritage resources are to be impacted by the development. If heritage resources are identified at or near any proposed infrastructure, an assessment of the significance of the heritage resources and the impact to the identified heritage resource must be completed. A report detailing the results of the survey must be submitted to SAHRA before construction commences. » Construction managers/foremen should be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites. » A map of the identified palaeontological resources relative to the layout of the proposed development must be emailed to the SAHRA case officer and the ECO must monitor all excavations associated with the BESS.		
Residual Impacts » There will not be residual impacts as a walkthrough would have been conducted prior to site establishment. However, if any impacts occur, they are irreversible so even the slightest disturbance will be residual (assuming all mitigation was applied). » If concentrations of archaeological heritage material and human remains are uncovered during construction, all work must cease immediately and be reported to the Albany Museum (046 622 2312) and/or the South African Heritage Resources Agency (SAHRA) (021 642 4502) so that systematic and professional investigation/ excavation can be undertaken.		

Impact Nature: Palaeontological heritage resources may be impacted by the construction phase of the proposed development		
	With Mitigation	**Without Mitigation**
Extent	(Low 1) Localised within the site boundary.	(Low 1) Localised within the site boundary.

Duration	(High 5) Where manifest, the impact will be permanent.	(High 5) Where manifest, the impact will be permanent.
Magnitude	(Low 1) The sediments underlying the proposed development have very high palaeontological sensitivity.	(Medium 6) The sediments underlying the proposed development have very high palaeontological sensitivity.
Probability	(Low 1) It is improbable that fossils Abrahamskraal formation would be impacted	(Low 1) It is improbable that fossils Abrahamskraal formation would be impacted
Significance	Low (1+5+1)x1=7	Low (6+5+1)x1=12
Status	Neutral	
Reversibility	(Low) Any impacts to heritage resources that do occur are irreversible	Low 1) Any impacts to heritage resources that do occur are irreversible
Irreplaceable loss of resources	(Low) Possible	(Low) Possible
Can impacts be mitigated?	Yes	Yes

Mitigation

» A walk-down of the proposed BESS area is required prior to construction. This must be conducted by a qualified archaeologist to ensure that no heritage resources are to be impacted by the development. If heritage resources are identified at or near any proposed infrastructure, an assessment of the significance of the heritage resources and the impact to the identified heritage resource must be completed. A report detailing the results of the survey must be submitted to SAHRA before construction commences.
» Construction managers/foremen should be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites.
» A map of the identified palaeontological resources relative to the layout of the proposed development must be emailed to the case officer and the ECO must monitor all excavations associated with the BESS..

Residual Impacts

» There will not be residual impacts as a walkthrough would have been conducted prior to site establishment. However, if any impacts occur they are irreversible so even the slightest disturbance will be residual (assuming all mitigation was applied).
» If concentrations of archaeological heritage material and human remains are uncovered during construction, all work must cease immediately and be reported to the Albany Museum (046 622 2312) and/or the South African Heritage Resources Agency (SAHRA) (021 642 4502) so that systematic and professional investigation/ excavation can be undertaken.

6.5.1. Implications for Project Implementation

Implications in terms of archaeology, palaeontology and cultural landscape have been identified. There are no fatal flaws or implications identified from a heritage perspective. The significance of the impacts will be low, with the implementation of the recommended mitigation measures. No heritage implications of high significance are expected, and the development of the BESS and associated infrastructure is acceptable, subject to the implementation of the recommendations made by the specialist.

6.6. Assessment of Noise Impacts

Enviro-Acoustic Research cc was commissioned to compile a Noise Compliance Statement as part of the Environmental Authorisation for the proposed Battery Energy Storage System (BESS) and associated infrastructure at the Gunstfontein Wind Energy Facility. The maximum sound level anticipated from the BESS

will be 50 dB at source when the BESS gets to a certain temperature and requires cooling or heating. This is a low sound level and will result in the noise being inaudible at distances further than 200m.

The site was visited in October 2015 when ambient sound levels were measured in the area. The area has a rural character in terms of appearance and development, with a high potential to be quiet at times. Ambient sound levels were elevated at times, mainly due to wind-induced noises (natural). As most of the area was considered naturally quiet, it was selected to assign an acceptable noise rating level of a rural noise district (as per SANS 10103:2008). Typical night-time sound levels will be less than 35 dBA with daytime sound levels being less than 45 dBA (no, or low wind conditions). Due to low anthropogenic-related development in the area, ambient sound levels measured in this area would still be similar in 2020.

Residential areas and potential noise-sensitive developments/receptors were identified using tools such as Google Earth® as well as the potential sensitive areas (using the online Screening Tool). The status of the receptors was confirmed and defined during the site visit in October 2015 when ambient sound levels were measured. Due to very low growth rates in the Karoo, it is highly unlikely that NSDs would have increased in the last 5 years. The closest identified receptor is located further then 2 000 m from the proposed area where the BESS may be developed. At this distance sounds from the BESS will be inaudible.

It is the opinion of Enviro-Acoustic Research cc that the noise from the climate control system of the BESS is significantly less than the noise that will be generated by the wind turbines of the proposed Gunstfontein WEF and these noises will not cumulatively add to the noise of the WEF.

Furthermore, Enviro-Acoustic Research cc were also of the opinion that there exists no potential for a noise impact and that no further Scoping or other acoustical studies would be required for the proposed BESS. No specific mitigation measures regarding noise or additional noise measurements are recommended. No additional conditions regarding noise are recommended for inclusion in the EMPr. It is therefore recommended that the Gunstfontein BESS project be approved from an acoustic perspective.

6.6.1. Implications for Project Implementation

Noise implications as a result of the climate control system of the BESS have been assessed. No fatal flaws or implications have been identified from a noise perspective. No noise implications other than that of low significance are expected as the noise from the climate control system of the BESS is significantly less than the noise that will be generated by the wind turbines of the proposed Gunstfontein WEF and these noises will not cumulatively add to the noise of the WEF. It is therefore recommended that the Gunstfontein BESS project be approved from an acoustic perspective.

6.7. Assessment of the Impacts on Soils and Agricultural Potential

The impacts of the proposed Gunstfontein BESS project on soil and agricultural productivity, will mainly occur during the construction phase. Below follows a rating of the significance of each of the impacts.

Impact Nature: Reduction of land with natural vegetation for livestock grazing

Earth-moving equipment will be used to clear the vegetation all along the area where the BESS will be constructed. In areas where obstacles such as rock outcrops are present, earth-moving equipment will be used to prepare the surface for the delivery of the construction materials.

The availability of grazing land for livestock farming will be reduced during the construction phase. It is anticipated that the significance impact will remain the same as the BESS area will likely be fenced-off for security purposes.

	With Mitigation	Without Mitigation
Extent	Local (1)	Local (1)
Duration	Short duration - 2-5 years (2)	Short duration - 2-5 years (2)
Magnitude	Low (4)	Low (4)
Probability	Definite (4)	Definite (4)
Significance	**Low (28)**	**Low (28)**
Status	Negative	Negative
Reversibility	High	High
Irreplaceable loss of resources	Yes	Yes
Can impacts be mitigated?	Yes	Yes

Mitigation

- Vegetation clearance must be restricted to areas where infrastructure is constructed.
- Removal of obstacles to allow for access of construction vehicles must be kept to only where essential.
- Prior arrangements must be made with the landowners to ensure that livestock and game animals are moved to areas where they cannot be injured by vehicles traversing the area.
- No boundary fence must be opened without the landowners' permission.
- All left-over construction material must be removed from site once construction on a land portion is completed.
- No open fires made by the construction teams are allowable during the construction phase.

Residual Impacts

- The residual impact from the construction and operation of the Gunstfontein BESS is considered low.

Impact Nature: Soil erosion

All areas where vegetation is removed from the soil surface in preparation for the BESS construction, will result in exposed soil surfaces that will be prone to erosion. Both wind and water erosion are a risk and even though the project area is in the arid climate, the intensity of single rainstorm may result in soil particles being transported away. Once the soil particles are removed, vegetation will have difficulty establishing itself on the rock and lithic material in the area.

The clearing and levelling of a limited area of land (3 to 4 ha) within the proposed project assessment zone will increase the risk of soil erosion in the area. It is anticipated that the risk will naturally reduce as grass and lower shrubs re-establishes in the areas around the new infrastructure once the construction has wrapped up and the operational phase continues.

	With Mitigation	Without Mitigation
Extent	Local (1)	Local (1)
Duration	Medium-term (3)	Medium-term (3)
Magnitude	Low (4)	Moderate (6)
Probability	Improbable (2)	Probable (3)
Significance	**Low (16)**	**Medium (30)**
Status	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources	No	Yes
Can impacts be mitigated?	N/A	Yes

Mitigation

- Land clearance must only be undertaken immediately prior to construction activities and only within the development footprint;
- Unnecessary land clearance must be avoided;

» Level any remaining soil removed from excavation pits that remained on the surface instead of allowing small stockpiles of soil to remain on the surface.
» Where possible, conduct the construction activities outside of the rainy season.

Residual Impacts

» The residual impact from the construction and operation of the proposed Gunstfontein BESS on the susceptibility to erosion is considered low.

Impact Nature: Soil pollution

During the construction phase, construction workers will access the land for the preparation of the terrain and the construction of BESS infrastructure. Both potential spills and leaks from construction vehicles and equipment as well as waste generation on site, can result in soil pollution.

The following construction activities can result in the chemical pollution of the soil:

1. Petroleum hydrocarbon (present in oil and diesel) spills by machinery and vehicles during earthworks and the removal of vegetation as part of site preparation.
2. Spills from vehicles transporting workers, equipment, and construction material to and from the construction site.
3. The accidental spills from temporary chemical toilets used by construction workers.
4. The generation of domestic waste by construction workers.
5. Spills from fuel storage tanks during construction.
6. Pollution from concrete mixing.
7. Any construction material remaining within the construction area once construction is completed.
8. Containment breaches related to the battery units and any inadvertent chemical exposure therefrom.

During the operational phase of the BESS, maintenance and repairs can result in waste generation within the assessment zone. Inappropriate storage, handling and disposal of this waste has the potential to impacts on soils.

	With Mitigation	Without Mitigation
Extent	Local (1)	Local (1)
Duration	Short-term (2)	Short-term (2)
Magnitude	Low (4)	Moderate (6)
Probability	Improbable (2)	Low (4)
Significance	Low (14)	Medium (36)
Status	Negative	Negative
Reversibility	Low	Low
Irreplaceable loss of resources	No	Yes
Can impacts be mitigated?	N/A	Yes

Mitigation

» Maintenance must be undertaken regularly on all vehicles and construction/maintenance machinery to prevent hydrocarbon spills;
» Any waste generated during construction, must be stored into designated containers and removed from the site by the construction teams.
» Any left-over construction materials must be removed from site.
» Ensure battery transport and installation by accredited staff / contractors.
» Compile (and adhere to) a procedure for the safe handling of battery cells during transport and installation.

Residual Impacts

» The residual impact from the construction and operation of the proposed project will be low to negligible.

6.7.1. Implications for Project Implementation

From the findings of the Agricultural Compliance Report, obtained through desktop studies as well as gathered baseline data it was concluded that the area is considered to have Low Sensitivity to the proposed

development. The soil forms observed within the project assessment zone confirmed the details of the land type analysis that indicates very low suitability of these areas for arable crop production. The dominant soil forms identified in Gunstfontein BESS project assessment zone are solid rock, Mispah and shallow Bethesda profiles. Further to the low soil suitability, the arid climate (accompanied by long drought spells) from time to time, makes these areas not suitable for rainfed agriculture. It is therefore evident that from an agricultural perspective, there are no implications for the proposed BESS implementation.

6.8. Positive impacts associated with the proposed Gunstfontein BESS

A number of potential positive impacts are associated with the establishment and operation of the BESS at the Gunstfontein Wind Farm. These include:

- The ability to support the integration of the wind energy facility into the electricity grid and operate at optimal levels. The BESS will be utilised to store energy produced by the WEF at times when surplus energy is produced (i.e. at times where production exceeds demand), where previously the facility would be running at a lower efficiency to supply that reduced demand, with a potential of unused energy being lost (load levelling).
- Increased energy production from the WEF and extension of the production time thereof by releasing stored energy that may otherwise have been lost, at times of high demand or poor generation. This reduces the dependence on conventional inefficient energy generation technologies that would be utilised during peak times and defers the need to construct additional power generation facilities with a footprint larger than that of the BESS to provide electricity in the hours during which electricity can be supplied to the grid from the BESS. This reduces the potential for cumulative impacts on the environment associated with the construction of additional power generation facilities.
- Storage of energy allows for a reduced dependence on fossil fuel-based peaking plants. The benefits of this scenario relates to reduced use of non-renewable resources and net emissions, and the associated reduced associated environmental impacts.
- Employment opportunities: Minor employment opportunities will be provided by the BESS during its construction, and less so during operation, as a result of the required maintenance and control of the BESS. Although not significant, this contributes in a small way in addressing issues relating to unemployment in the region.

6.9. Assessment of the 'Do Nothing' Alternative

The 'do-nothing' alternative (i.e. no-go alternative) is the option of not constructing the Gunstfontein Battery Energy Storage System. Should this alternative be selected, there would be no direct environmental impacts within the designated BESS footprint. The implementation of the 'do-nothing' alternative will result in the Gunstfontein Wind Energy Facility not being able to store additional generated energy or evacuate additional generated electricity to the national grid at times when the WEF is not producing optimally and will, therefore, result in lost opportunity to dispatch additional electricity from the facility, and to realise positive environmental impacts.

To ensure a positive environmental impact, the environmental benefits of the energy storage technology must out-weigh the potential negative impacts.

Based on the outcomes of the specialist studies undertaken (as outlined in this chapter of the report), it can be concluded that limited environmental costs can be anticipated at a local and site-specific level, and

are considered acceptable provided the mitigation measures as outlined in the BA Report and the EMPr are implemented and adhered to. These environmental costs could include:

» A loss of biodiversity, flora and fauna due to the clearing of land approximately 4-6ha for the construction and utilisation of land for the BESS and associated infrastructure. The ecological assessment predicted the impacts to be low provided that the final footprint of the facility is located outside of the identified high sensitivity areas.
» In terms of soils and agricultural potential, impacts during the operational phase may associated with maintenance of the infrastructure as well as possible repairs that may be required in the case of equipment failure. With the implementation of appropriate mitigation measures, these impacts are expected to be of low significance.

These costs are expected at a local level and can be effectively mitigated and managed.

As detailed above, the 'do-nothing' alternative will result in a number of lost opportunities and will conserve only a minor (~4ha) portion of vegetation and habitat within the broader Gunstfontein WEF footprint. The 'do nothing' alternative is therefore not considered to have a significant benefit when compared to the implementation of the proposed BESS, and is therefore not considered as a preferred alternative and not proposed to be implemented for the development of the facility.

CHAPTER 7: ASSESSMENT OF POTENTIAL CUMULATIVE IMPACTS

As identified and assessed in Chapter 6, the development of the BESS and associated infrastructure may have effects (positive and negative) on natural resources, the social environment and on the people living in a project area. The preceding impact assessment chapter has reported on the assessment of the impacts associated with the BESS and associated infrastructure for Gunstfontein Wind Energy Facility largely in isolation (from other similar developments).

This chapter assesses the potential for the impacts associated with the BESS and associated infrastructure to become more significant when considered in combination with the other known or proposed projects within the area.

7.1. Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report

This chapter of the BA Report includes the following information required in terms of Appendix 1: Content of BA Reports:

Requirement	Relevant Section
3(j)(i) an assessment of each identified potentially significant impact and risk, including cumulative impacts.	The cumulative impacts associated with the development of the BESS and associated infrastructure are included and assessed within this chapter.

7.2. Approach taken to Assess Cumulative Impacts

The cumulative impacts that have the potential to be compounded through the development of the proposed project in proximity to other similar developments in the area include impacts such as those listed below:

- Unacceptable loss of habitat or landscape connectivity through clearing, resulting in an impact on the conservation status of such flora, fauna or ecological functioning.
- Unacceptable risk to fauna through loss of avifaunal habitats, and impacts to nesting areas.
- Unacceptable loss of agricultural potential areas presenting a risk to current land use activities and increased soil erosion.
- Unacceptable loss of heritage resources (including palaeontological and archaeological resources).

The role of the cumulative assessment is to determine and confirm if such impacts are relevant to the Gunstfontein BESS within the study area being considered for the development.

It is important to explore the potential for cumulative impacts as this will lead to a better understanding of these impacts and the potential for mitigation that may be required in order to ensure that the concentration of energy related developments, specifically BESSs, does not lead to detrimental environmental impacts. The scale at which the cumulative impacts are assessed is important. For example, the significance of the cumulative impact on the regional or national economy will be influenced by energy developments with BESS throughout South Africa, while the significance of the cumulative impact on loss of land within a concentrated area may only be influenced by developments that are in closer proximity to each other. For practical purposes a sub-regional scale of 30km has been selected for this cumulative

impact evaluation (refer to **Figure 7.1**). There are no existing or authorised BESS developments within this area. A proposed BESS is currently under investigation at the Gunstfontein WEF, located 27km north of the proposed site. The following energy developments are located within the broader area:

- The authorised Gunstfontein Wind Energy Facility and associated infrastructure, including power line and substation.
- The authorised Great Karoo Wind Energy Facility and associated infrastructure, including power line and substation
- The authorised Soetwater Wind Energy Facility and associated infrastructure, including power line and substation (currently under construction)
- The authorised Karusa Wind Energy Facility and associated infrastructure, including power line and substation (currently under construction)

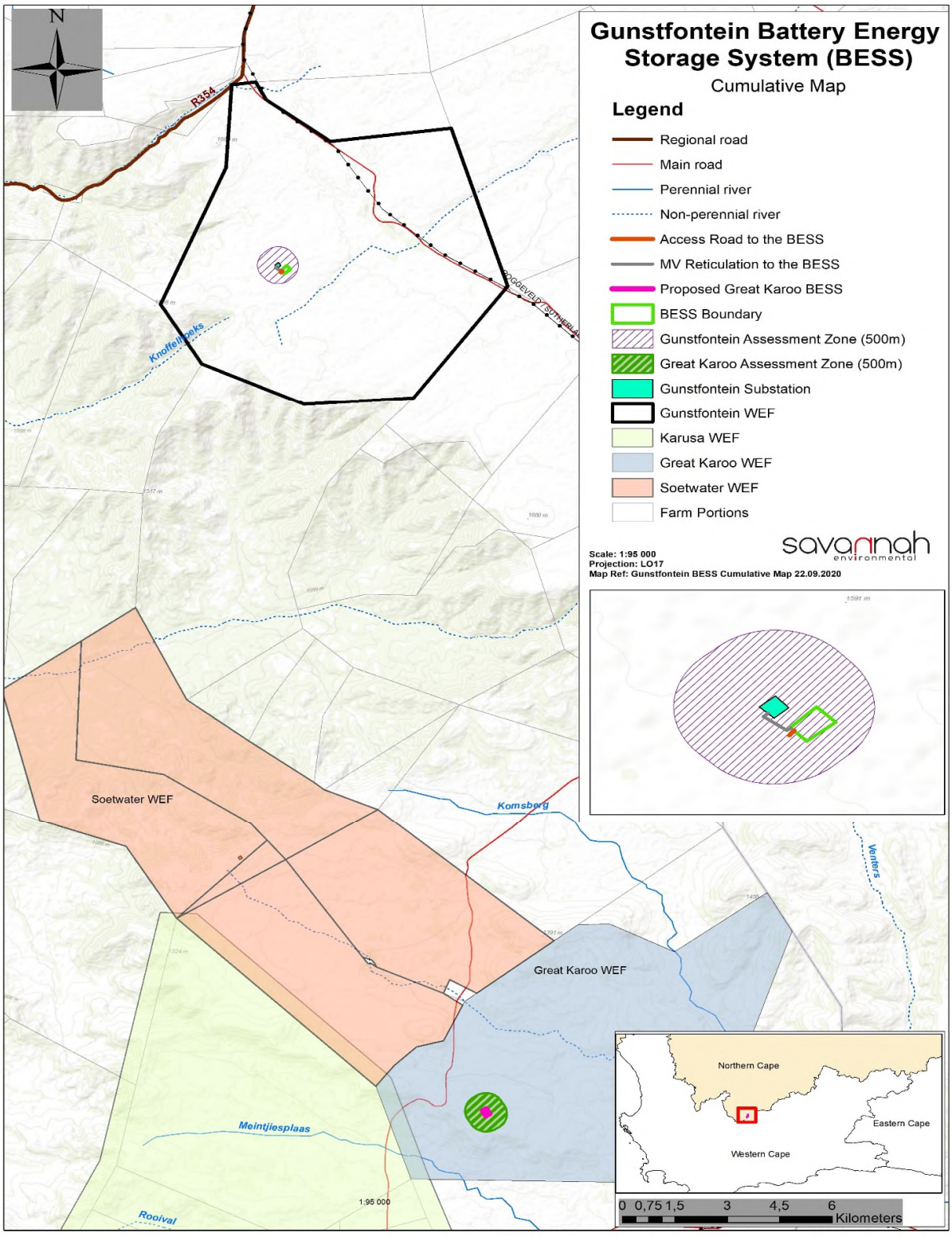

Figure 7.1: Cumulative map for the Gunstfontein BESS and associated infrastructure showing electrical infrastructure related to the two BESS projects known to be planned in the area.

The development of the BESS and associated infrastructure will not introduce a new type of infrastructure to the area but will merely be adding to the already developed landscape. Considering the limited extent of the proposed BESS and associated infrastructure, the addition will be limited with the BESS not conflicting with the planned land use in the area.

In addition, the 500m assessment zone around the Gunstfontein substation, assessed for the BESS and associated infrastructure is located within a Renewable Energy Development Zone (REDZ) (i.e. the Komsberg REDZ), and a Strategic Transmission Corridor (i.e. the Central Transmission Corridor). These areas form part of the areas identified by the DEFF as geographical areas of strategic importance for the development of commercial renewable energy developments (REDZ) and large-scale grid infrastructure development projects (transmission corridors). Therefore, these areas are considered as nodes for the development of renewable energy and grid infrastructure projects.

The cumulative impacts of the other known energy related infrastructure and associated infrastructure are qualitatively assessed in this Chapter and has been considered within the specialist studies (refer to **Appendices D-G**). The following potential impacts are considered:

» Cumulative impacts on ecological processes.
» Cumulative impacts on heritage resources.
» Cumulative impacts on noise resources.
» Cumulative impacts on soils and agricultural potential.

7.3. Cumulative Impacts on Ecological Processes

The following are the cumulative impacts assessed as being a likely consequence of the development of the Gunstfontein BESS. This is assessed in context of the extent of the proposed development area, other developments in the area, as well as general habitat loss and transformation resulting from agriculture and other activities in the area.

Nature: Impact on CBAs and broad-scale ecological processes The development of Gunstfontein BESS will contribute to cumulative habitat loss within CBAs and other broad-scale cumulative impacts on ecological processes in the wider Roggeveld area..		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Local (1)	Local (2)
Duration	Long-term (4)	Long-term (4)
Magnitude	Low (2)	Moderate (5)
Probability	Improbable (2)	Probable (3)
Significance	Low (14)	Medium (33)
Status	Negative	Negative
Reversibility	High	Moderate
Irreplaceable loss of resources	Low	Low
Can impacts be mitigated	To some degree, but the majority of the impact results from the presence of the various already approved WEFs which cannot be well mitigated.	
Mitigation:		

»	Ensure that sensitive habitats such as drainage features, are not within the development footprint of the BESS.
»	Ensure that the fencing around the facility is wildlife friendly and does not impede fauna from moving through the area or result in electrocutions.
»	Ensure that an alien invasive management plan and erosion management plan compiled for the BESS project is effectively implemented at the site.

7.6. Cumulative Impacts on Heritage (including archaeology, palaeontology and cultural landscape)

The proposed BESS development will form part of the infrastructure required for the Gunstfontein WEF and is located immediately adjacent to the substation and operations and maintenance facilities associated with the Gunstfontein WEF. Furthermore, the proposed BESS is located within an already approved WEF which is also located within a REDZ. In terms of impacts to heritage resources, it is preferred that this kind of infrastructure development is concentrated in one location and is not sprawled across an otherwise culturally significant landscape. The construction of the proposed BESS is therefore unlikely to result in unacceptable risk or loss, nor will the proposed BESS development result in a complete change to the sense of place of the area or result in an unacceptable increase in impact.

7.7. Cumulative Impacts on Noise

The noise from the climate control system of the BESS is significantly less than the noise that will be generated by the wind turbines of the proposed Gunstfontein WEF and these noises will not cumulatively add to the noise of the WEF.

It is the opinion of the noise specialist that there exists no potential for a noise impact and that no further Scoping or other acoustical studies would be required for the proposed BESS. Furthermore, no specific mitigation measures regarding noise or additional noise measurements are recommended and there are no additional conditions regarding noise recommended for inclusion in the EMPr. It is therefore recommended that the Gunstfontein BESS project be approved from an acoustic perspective.

7.8. Cumulative Impacts on Soils and Agricultural Potential

Nature: Reduction of land with natural vegetation for livestock grazing Any additional infrastructure that will be constructed to strengthen and support the operation of the Gunstfontein Wind Energy Facility, will result in additional areas where grazing veld will be disturbed.		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Local (1)	Regional (2)
Duration	Short duration - 2-5 years (2)	Long-term (4)
Magnitude	Low (4)	Low (4)
Probability	Highly likely (4)	Highly likely (4)
Significance	**Low (28)**	**Medium (40)**
Status (positive/negative)	Negative	Negative
Reversibility	High	Low
Loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	No
Mitigation:		

The only mitigation measure for this impact is to keep the footprints of all renewable energy facilities as small as possible and to manage the soil quality by avoiding far-reaching soil degradation such as erosion.

Impact 2:

Nature: Soil Erosion Any additional infrastructure that will be constructed to strengthen and support the operation of the Gunstfontein Wind Energy Facility will result in additional areas where exposed to soil erosion through wind and water movement.		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Local (1)	Regional (2)
Duration	Medium-term (3)	Medium-term (3)
Magnitude	Low (4)	Moderate (6)
Probability	Improbable (2)	Probable (3)
Significance	Low (16)	**Medium (33)**
Status (positive/negative)	Negative	Negative
Reversibility	Low	Low
Loss of resources?	No	Yes
Can impacts be mitigated?	N/A	No
Confidence in findings: High.		
Mitigation: Each of the projects should adhere to the highest standards for soil erosion prevention and management as defined above this table.		

Nature: Soil Pollution Any additional infrastructure that will be constructed to strengthen and support the operation of the Gunstfontein Wind Energy Facility and where waste is not removed to designated waste sites, will increase the cumulative impacts associated with soil pollution in the area.		
	Overall impact of the proposed project considered in isolation	**Cumulative impact of the project and other projects in the area**
Extent	Local (1)	Regional (2)
Duration	Short-term (2)	Short-term (2)
Magnitude	Moderate (6)	Moderate (6)
Probability	Probable (3)	Probable (3)
Significance	**Low (27)**	**Medium (30)**
Status (positive/negative)	Negative	Negative
Reversibility	Low	Low
Loss of resources?	Yes	Yes
Can impacts be mitigated?	Yes	No
Confidence in findings: High.		
Mitigation: Each of the projects should adhere to the highest standards for soil pollution prevention and management as defined in above this table.		

7.9. Contribution of the Project to Climate Change Mitigation

South Africa is a country with an economy dependent on coal for the majority of its electricity, an energy-intensive industrial sector and an energy sector responsible for 82% of total GHG emissions, making it the 12th highest world emitter of GHG[4].

It has been reported internationally that the move towards renewable energy for electricity generation needs has resulted in decreased greenhouse gas emissions. The International Energy Agency announced in March 2015 that 2014 carbon dioxide emissions from the energy sector levelled off for the first time in 40 years. This has happened without being linked to an economic downturn. This was attributed to the increase in the use of renewable energy sources by China and OECD countries[5]. As GHG emissions associated with the provision of energy services are a major cause of climate change, this move to renewable energy and subsequent reduction in CO_2 emissions is considered as a positive contribution towards climate change mitigation.

The South African Government recognises the need to diversify the mix of energy generation technologies within the country and to reduce the country's reliance on fossil fuels which contribute towards climate change and are therefore not environmentally friendly. This is in accordance with the prescriptions of the United Nations Convention on Climate Change 1994 (UNFCCC) and its associated Kyoto protocol of 1997.

Consequently, the South African Government has recognised the need to move towards cleaner energy and has therefore set targets for cleaner energy technologies by 2030 (IRP, 2019). Renewable energy plays a key role in mitigating global greenhouse gas emissions by radically lowering the emissions profile of the global energy system (International Renewable Energy Agency (IRENA), 2015). The proposed BESS will assist in reducing the country's CO_2 emissions associated with energy supply relative to fossil fuels (e.g. coal) as it will enable additional energy generated by a renewable energy source (i.e. wind power) to be fed into the national grid. Development of numerous such facilities will have a cumulative positive impact on CO_2 emissions as this will reduce reliance on power generation from fossil fuels. This will aid the country in meeting the commitments made under the COP 21 Agreement, to which the Government is a signatory.

In addition to these significant positive impacts as a result of the BESS not only on the environment but also for society at an international level, BESS facilities will also improve the production, security and reliability of renewable energy facilities in the broader region implementing.

7.10. Conclusion regarding Cumulative Impacts

Cumulative impacts and benefits on various environmental and social receptors will occur to varying degrees with the development of several renewable energy facilities in South Africa. The most significant of these will be the contribution towards a reduction in greenhouse gas emissions and consequent assistance with climate change mitigation, as well as the increase in energy production and efficiency.

The alignment of renewable energy developments (and associated BESS such as that proposed) with the IRP and the global drive to move away from the use of non-renewable energy resources and to reduce greenhouse gas emissions is undoubtedly positive. The assessment of the cumulative impacts associated

[4] Greenhouse Gas Inventory for South Africa: 2000-2010
[5] http://ecowatch.com/2015/03/23/renewables-mitigate-climate-change/

with the Gunstfontein BESS was undertaken through the consideration of the impacts in isolation and compared to the cumulative impacts of the BESS and other energy related facilities in the area. Cumulative impacts are expected to occur with the development of the Gunstfontein BESS and associated infrastructure throughout all phases of the project life cycle and within all areas of study considered as part of this BA report. The main aim for the assessment of cumulative impacts considering the development of the Gunstfontein BESS and associated infrastructure is to identify associated cumulative impacts and determine whether the development will be acceptable within the landscape proposed for the development, and whether the loss, from an environmental and social perspective, will be acceptable without whole-scale change.

All cumulative impacts associated with the Gunstfontein BESS and associated infrastructure will be of a low to medium significance. A summary of the cumulative impacts is included in **Table 7.2** below.

Table 7.2: Summary of the cumulative impact significance of the BESS and associated infrastructure within the 500m assessment zone surrounding the Gunstfontein Substation

Specialist assessment	Overall significance of impact of the proposed project considered in isolation	Cumulative significance of impact of the project and other projects in the area
Ecology	Low	Medium
Heritage (archaeology, palaeontology and cultural landscape)	Low	Low
Noise	Low	Low
Soils and Agricultural Potential	Low	Medium

Based on the specialist cumulative assessment and findings, the development of the BESS and associated infrastructure for the Gunstfontein Wind Energy Facility and its contribution to the overall impact of other energy infrastructure to be developed within the area, it can be concluded that the contribution of the project to cumulative impacts will be of a low significance. There are no impacts or risks identified to be of a high significance or considered as unacceptable with the development of the BESS and associated infrastructure within the assessed 500m assessment zone surrounding the Gunstfontein Substation. In addition, no impacts that will result in whole-scale change are expected to occur.

CHAPTER 8: CONCLUSIONS AND RECOMMENDATIONS

Gunstfontein Wind Farm (Pty) Ltd proposes the construction and operation of a Battery Energy Storage System (BESS) and associated infrastructure at the authorised Gunstfontein WEF (DEFF Ref: 14/12/16/3/3/2/826) near Sutherland, Northern Cape Province. The BESS solution will include the development of the BESS to be located near to the authorised WEF substation and will be approximately4ha in total extent. Overhead or underground MV cabling (33kV or less) will connect the BESS to the WEF substation and an access road will be developed from the authorised WEF roads to the BESS site (up to 500m in length). The BESS is envisaged to become an integral component of the authorised WEF.

The infrastructure includes:

- A Battery Energy Storage System (BESS) inside containers or other housing structures with a footprint of up to 4ha in extent and a maximum height of 4m. Both Lithium-ion and Redox-flow technology are being considered for the project, depending on which is most feasible at the time of implementation.
- An 8m wide access road to the BESS (6m wide road surface with 1m drainage on each side of the road) branching off of the WEF roads, and internal roads (up to 8m wide) within the footprint of the BESS, as needed
- MV Cabling (underground or overhead) between the BESS and the authorised WEF substation.
- Fencing around the BESS for increased security measures.
- Possible firebreak around the BESS, within the 4ha BESS footprint.
- Temporary laydown area within the 4ha footprint of the BESS.

The BESS facility will be located within the Remainder of Farm Gunstfontein 131, identified by the applicant as the preferred project site suitable for the development of a BESS, owing to the required placement of the BESS near the WEF substation.

An area of ~500m around the boundary of the Gunstfontein WEF Substation was assessed within this Basic Assessment process to allow for the optimization of the placement of the BESS. Specialist studies undertaken in support of this application were required to be in accordance with the recently promulgated Specialist Protocols.

Two types of battery storage systems and technologies were detailed in this Basic Assessment. It is clear that while there are significant differences in how these systems operate, their design and functions are closely related. As such, the issues and impacts associated with the various technologies are cross-cutting and common to both technologies. It is important to note that while both types of technologies are being offered, no preferred technology selection is currently possible given the fast pace of development and steady price decreases of the BESS technologies in general. In addition, should appropriate controls and mitigation measures be implemented, no discernible environmental preference is evident between these technologies and thus both are being put forward for authorisation with equal preference. Should the development be authorised, it is thus requested that both technology options (lithium-ion or redox-flow) be authorised for development on the understanding that further investigation into the specific technologies available at the time of being awarded preferred bidder status will allow for one of two to be selected and ultimately developed.

A summary of the recommendations and conclusions for the proposed project as determined through the BA process is provided in this Chapter 7.

8.1. Legal Requirements as per the EIA Regulations, 2014 (as amended), for the undertaking of a Basic Assessment Report

This chapter of the BA Report includes the following information required in terms of Appendix 1: Content of BA reports:

Requirement	Relevant Section
3(k) where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report	A summary of the findings of the specialist studies undertaken for the BESS and associated infrastructure has been included in section 8.2.
3(l) an environmental impact statement which contains (i) a summary of the key findings of the environmental impact assessment, (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.	An environmental impact statement containing the key findings of the environmental impacts of the Gunstfontein BESS and associated infrastructure has been included as section 8.5. An environmental sensitivity and layout map of the Gunstfontein BESS and associated infrastructure has been included as **Figure 8.1** which overlays the assessed 500m assessment zone around the Gunstfontein Substation with the sensitive environmental features present within this zone. A summary of the positive and negative impacts associated with the development of the Gunstfontein BESS and associated infrastructure has been included in section 8.2.
3(n) any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation.	All conditions required to be included in the Environmental Authorisation for the g Gunstfontein BESS and associated infrastructure have been included in section 8.4
3(p) a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation.	A reasoned opinion as to whether the Gunstfontein BESS and associated infrastructure associated with the Gunstfontein WEF should be authorised has been included in section 8.6.

8.2. Evaluation of the BESS and Associated Infrastructure for the Gunstfontein Wind Energy Facility

The preceding chapters of this report together with the specialist studies contained within **Appendices D-G** provide a detailed assessment of the potential impacts that may result from the development of the Gunstfontein BESS and associated infrastructure. This chapter concludes the environmental assessment of the proposed development by providing a summary of the results and conclusions of the assessment. In doing so, it draws on the information gathered as part of the BA process, the knowledge gained by the environmental specialists and the EAP, and presents a combined and informed opinion of the environmental impacts associated with the project.

No environmental fatal flaws or impacts of high significance were identified in the detailed specialist studies conducted, and no impacts of unacceptable significance are expected to occur with the implementation of the recommended mitigation measures. These measures include, amongst others, the avoidance of sensitive features as specified by the specialists.

The potential environmental impacts associated with the BESS and associated infrastructure for the Gunstfontein Wind Energy Facility identified and assessed through the BA process include:

Ecological Impacts - From the findings of the Ecological Impact Assessment it can be concluded that there are no impacts associated with the establishment of Gunstfontein BESS that cannot be mitigated to a low significance. Although cumulative impacts in the area are a concern due to the high density of wind energy developments in the area, the contribution of the Gunstfontein BESS would be low and is not considered to be of significance. As such, there are no fatal flaws or high post-mitigation impacts that should prevent the development from proceeding. Based on the preliminary layout provided for the assessment, and the 500m assessment region, the Gunstfontein BESS can be supported from a terrestrial ecology point of view provided it is located within the areas of moderate or low ecological sensitivity within the 500m assessment region.

Impacts on Heritage Resources – Impacts on archaeology, palaeontology and cultural landscape have been identified. No fatal flaws have been identified from a heritage perspective. The significance of the impacts will be low, with the implementation of the recommended mitigation measures. No heritage impacts of high significance are expected, and the development of the BESS and associated infrastructure is acceptable, subject to the implementation of the recommendations made by the specialist.

Impacts on Noise Resources – Noise impacts on the climate control system of the BESS have been assessed. No fatal flaws have been identified from a noise perspective. No noise impacts other than that of low significance are expected as the noise from the climate control system of the BESS is significantly less than the noise that will be generated by the wind turbines of the proposed Gunstfontein WEF and these noises will not cumulatively add to the noise of the WEF. It is therefore recommended that the Gunstfontein BESS project be approved from an acoustic perspective.

Impacts on Agricultural Potential – From the findings of the Agricultural Compliance Report, obtained through desktop studies as well as gathered baseline data it was concluded that the area is considered to have Low Sensitivity to the proposed development. The soil forms observed within the project assessment zone confirmed the details of the land type analysis that indicates very low suitability of these areas for arable crop production. The dominant soil forms identified in Gunstfontein BESS project assessment zone are solid rock, Mispah and shallow Bethesda profiles. Further to the low soil suitability, the arid climate (accompanied by long drought spells) from time to time, makes these areas not suitable for rainfed agriculture

Cumulative Impacts - The contribution of the project to cumulative impacts will be of low significance. There are no identified impacts considered as presenting an unacceptable risk. In addition, no impacts that will result in whole-scale change are expected. There will however be several positive impacts associated with the development of the BESS which were discussed in more detail in Chapter 7 and 8.

8.3. Evaluation of the overall Environmental Sensitivity of the BESS and Associated Infrastructure for the Gunstfontein Wind Energy Facility

From the findings obtained from the Specialist studies, there are no unacceptable impacts and sensitivities anticipated for the proposed Gunstfontein BESS, and no significant disturbance of biological diversity is anticipated.

Avoidance of the high sensitivity areas was recommended from an ecological perspective. Therefore, no fatal flaws or "no-go" areas from an ecological perspective were identified from the specialist studies conducted for the BESS for the Gunstfontein Wind Energy Facility, provided it is located in areas of moderate or low ecological sensitivity within the 500m assessment area.

In addition, the heritage assessment determine that it is highly unlikely that the proposed BESS will negatively impact on significant archaeological or built environment heritage resources. According to the findings of heritage assessment, there were no archaeological resources found within the 500m assessment region conducted for the Gunstfontein WEF footprint.

The entire Gunstfontein BESS footprint is located within a high palaeosensitivity region, however the specialist finding indicated that SAHRA directed the WEF developed as follows: A map of the identified palaeontological resources relative to the layout of the proposed development must be emailed to the case officer and the ECO must monitor all excavations in the Gunstfontein WEF. The heritage specialist recommended this condition also apply to the BESS. Overall, from a heritage perspective, the proposed BESS was determined acceptable and could be located anywhere within the 500m area assessed. Mitigation measures provided by the specialist study were included into this report and the associated EMPr.

No noise impacts, as determined by the noise specialist, will result from the proposed BESS and no mitigations were applied. From a noise perspective the Gunstfontein BESS was deemed acceptable anywhere within the 500m assessment region.

Overall, no environmental fatal flaws were identified from the specialist studies conducted for the Gunstfontein BESS for the Gunstfontein Wind Energy Facility, provided the BESS and associated infrastructure are located in areas of moderate or low ecological sensitivity within the 500m assessment area.

All impacts associated with the project establishment within the BESS 500m assessment zone can be mitigated to acceptable levels or enhanced through the implementation of the recommended mitigation or enhancement measures. **Figure 2** provides an environmental sensitivity map of the BESS 500m assessment zone assessed as part of the BA process, as well as the environmental sensitivities identified.

8.4. Overall Conclusion (Impact Statement)

The specialist findings from the assessment of the 500m assessment zone surrounding the Gunstfontein Substation for the establishment of the BESS have indicated that there are no identified environmental fatal flaws or impacts of a high significance (following the implementation of mitigation) associated with the implementation of the BESS and associated infrastructure. All impacts associated with the project establishment within the 500m assessment surrounding the Gunstfontein Substation can be mitigated to acceptable levels or enhanced through the implementation of the recommended mitigation or enhancement measures.

As outlined in Section 6.9 benefits of the BESS and associated infrastructure include:

» The ability to assist in the integration of the wind energy facility into the electricity grid and operate at optimal levels.
» Increased energy dispatch from the WEF and extension of the production periods thereof by load levelling and dispatch of stored energy which may otherwise not have been made available, thereby reducing the dependence on conventional inefficient energy generation technologies that would be

utilised during peak times and defers the need to construct additional power generation facilities with a larger footprint than the BESS.
» Reduced dependence on fossil fuel based peaking plants, resulting in reduced use of non-renewable resources and net emissions, and the associated reduced associated environmental impacts.
» Employment opportunities during construction and operation, albeit limited

The benefits of the BESS and associated infrastructure for the Gunstfontein Wind Energy Facility are expected to occur at a national, regional and local level. As the costs to the environment at a site-specific level can been largely limited through the appropriate placement of the BESS and associated infrastructure within areas considered to be acceptable for the development of the, the benefits of the project are expected to outweigh the environmental costs of the BESS and associated infrastructure.

It has been concluded that the do nothing alternative will result in a number of lost opportunities and will conserve only a minor (~4ha) portion of vegetation and habitat within the broader Gunstfontein footprint. The 'do nothing' alternative is therefore not considered to have a significant benefit when compared to the implementation of the proposed BESS, and is therefore not considered as a preferred alternative and not proposed to be implemented for the development of the facility. Therefore, the implementation of the BESS and associated infrastructure is concluded to be the preferred alternative for implementation.

8.5. Overall Recommendation

Considering the findings of the independent specialist studies, the impacts identified, the 500m assessment zone surrounding the Gunstfontein Substation proposed by the developer, the avoidance of sensitive environmental features within the this 500m assessment zone where possible, as well as the potential to further minimise the impacts to acceptable levels through mitigation, it is the reasoned opinion of the EAP that the development of the BESS and associated infrastructure for Gunstfontein Wind Energy Facility is acceptable within the landscape and can reasonably be authorised to be developed and micro-sited within the 500m assessment zone surrounding the Gunstfontein Substation. Additionally, it is the reasoned opinion of the EAP that the BESS should be authorised for both technologies proposed.

The following infrastructure would be included within an authorisation issued for the project:

» A Battery Energy Storage System (BESS) inside containers or other housing structures with a footprint of up to 4ha in extent and a maximum height of 4m. Both Lithium-ion and Redox-flow technology are being considered for the project, depending on which is most feasible at the time of implementation.
» An 8m wide access road to the BESS (6m wide road surface with 1m drainage on each side of the road) branching off of the WEF roads, and internal roads (up to 8m wide) within the footprint of the BESS, as needed
» MV Cabling (underground or overhead) between the BESS and the authorised WEF substation.
» Fencing around the BESS for increased security measures.
» Possible firebreak around the BESS, within the 4ha BESS footprint.
» Temporary laydown area within the 4ha footprint of the BESS.

The following key conditions must included within an authorisation issued for the BESS and associated infrastructure:

- The BESS and associated infrastructure for the Gunstfontein WEF must be developed and optimised within the assessed 500m assessment zone surrounding the Gunstfontein substation. Areas of high sensitivity identified must be avoided.
- All mitigation measures detailed within this BA Report, as well as the specialist reports contained within **Appendices D-G**, are to be implemented.
- The EMPr as contained within **Appendix H** of this BA Report should form part of the contract with the Contractors appointed to construct and maintain the BESS and associated infrastructure in order to ensure compliance with environmental specifications and management measures. The implementation of this EMPr for all life cycle phases of the infrastructure is considered key in achieving the appropriate environmental management standards as detailed for this project.
- A pre-construction walk-through of the final BESS and associated infrastructure footprint by an ecologist to survey for species of conservation concern that would be affected and that can be translocated must be undertaken prior to the commencement of the construction phase. Relevant permits must be obtained where required.
- A chance find procedure must be developed and implemented in the event that archaeological or palaeontological resources are found during the construction of the BESS and associated infrastructure. In the case where the proposed development activities bring these materials to the surface, work must cease and SAHRA must be contacted immediately.
- It is recommended that a Pre-construction Walk-Through Survey is conducted within the final BESS footprint, to inform search-and-rescue efforts. Species of concern should be recorded and may only be removed, transplanted, destroyed (or any other form of disturbance) after the necessary approval (permits) has been obtained from the relevant authority. It is also important to note that species of ecological importance, local endemics and red-listed species should be translocated out of the development footprint, where these have a high probability of survival.

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