

Proposed Battery Energy Storage System (BESS) & associated infrastructure on Portion 111 (A Portion of 19) of the Farm Doornrandje 386J.R., City of Tshwane, Gauteng Province (DEA reference no: 14/12/16/3/3/1/2618)



Draft Basic Assessment Report
OCTOBER 2022

Prepared for:



Crocodile Reserve Energy Storage Pty (Ltd)

Prepared by:

Dzimuzwo Consulting

Mobile +27 64 522 2066

Email admin@dzimuzwo.co.za

Website www.dzimuzwo.co.za

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

DOCUMENT INFORMATION

Project Name	Crocodile Reserve Battery Energy Storage System
DEA Reference number	14/12/16/3/3/1/2618
Our Project Reference number	DZ#01#092022
Document Title	Draft Basic Assessment Report for the Proposed Battery Energy Storage System (BESS) & associated infrastructure on Portion 111 (A Portion of 19) of the Farm Doornrandje 386J.R., City of Tshwane, Gauteng Province
Environmental Assessment Practitioner	Lusani Madali
Accreditations	Environmental Assessment Practitioner Association of South Africa (EAPASA) South African Council for Natural Scientific Professions (SACNASP)
Junior Environmental Consultant	Mulanga Mandiwana

DISCLAIMER

This document has been prepared for Crocodile Reserve Energy Storage Pty (Ltd) for purposes of obtaining an Environmental Authorisation (EA) in accordance with the EIA regulatory framework. Any other party using this report for any purpose, or relying on it in any way, does so at their own risk. No representation or warranty, express or implied, is made to the accuracy or completeness of the information presented herein or its suitability for any other purpose other than intended. This document contains confidential information and proprietary intellectual property as such should not be edited or replicated unless permission has been granted by Crocodile Reserve Energy Storage Pty (Ltd) or Dzimuzwo Consulting (Pty) Ltd.

PURPOSE OF THE DOCUMENT AND INVITATION TO COMMENT

Crocodile Reserve Energy Storage Pty (Ltd) has appointed Dzimuzwo Consulting as an independent Environmental and Social consultant to undertake the Basic Assessment (BA) process for the proposed Battery Energy Storage System (BESS) & associated infrastructure on Portion 111 (A Portion of 19) of the Farm Doornrandje 386J.R., City of Tshwane, Gauteng Province. This BA process is being undertaken following the 2014 EIA Regulations (as amended) promulgated in the National Environmental Management Act (NEMA; Act 107 of 1998).

The report has been compiled following Appendix 1 of the EIA regulations, 2014 (as amended) and comprises the following chapters:

- ☐ Chapter 1: Introduction
- ☐ Chapter 2: Project Outline
- ☐ Chapter 3: Applicable Regulatory Context
- ☐ Chapter 4: Approach to the Basic Assessment Process
- ☐ Chapter 5: The receiving environment
- ☐ Chapter 6: Project's Impact Assessment
- ☐ Chapter 7: Project's Cumulative Impacts
- ☐ Chapter 8: Conclusion and Recommendations
- ☐ Chapter 9: References

EXECUTIVE SUMMARY

Crocodile Reserve Energy Storage (Pty) Ltd is proposing the development of a Battery Energy Storage System (BESS) and associated infrastructure on Portion 111 (A Portion of 19) of the Farm Doornrandje 386J.R. in Pretoria Rural, Gauteng Province within the Crocodile River Reserve Doornrandje Cluster (refer to the locality map below). The isolated site is approximately 10km northeast of Lanseria Airport and 8.1 km north of the Diepsloot residential area.

The Project will comprise associated infrastructure that will include:

- ☐ Transformer/s that will convert low voltage AC to medium/high voltage AC for connection to the grid;
- ☐ An 11-33KV to 88KV or 275kV substation located on the site with associated switching and protection gear and metering equipment;
- ☐ Mounting platforms for the BESS containers;
- ☐ Electrical cabling to interconnect the BESS containers;
- ☐ Auxiliary power supply infrastructure (from grid and photovoltaic panels) of up to 2,5MW;
- ☐ Low voltage electrical reticulation system;
- ☐ Internal access roads (4m – 6m wide) are located within site;
- ☐ Fencing of approximately 3m in height around the site and substation area;
- ☐ Infrastructure within the site comprising office buildings, warehouses, parking and a laydown area;
- ☐ Instrumentation and Control systems containing hardware and software for remote plant monitoring and operations;
- ☐ Connection to the grid via:
 - An 88KV or 275kV overhead line of approximately 250m connecting the substation to the Eskom grid; or
 - An 88KV or 275kV underground cable of approximately 250m connecting the substation to the Eskom grid
- ☐ Two access roads (6m wide) of approximately 350m in length each to access the site and substation area; and
- ☐ One or more water tanks for construction and or operational phase water usage.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

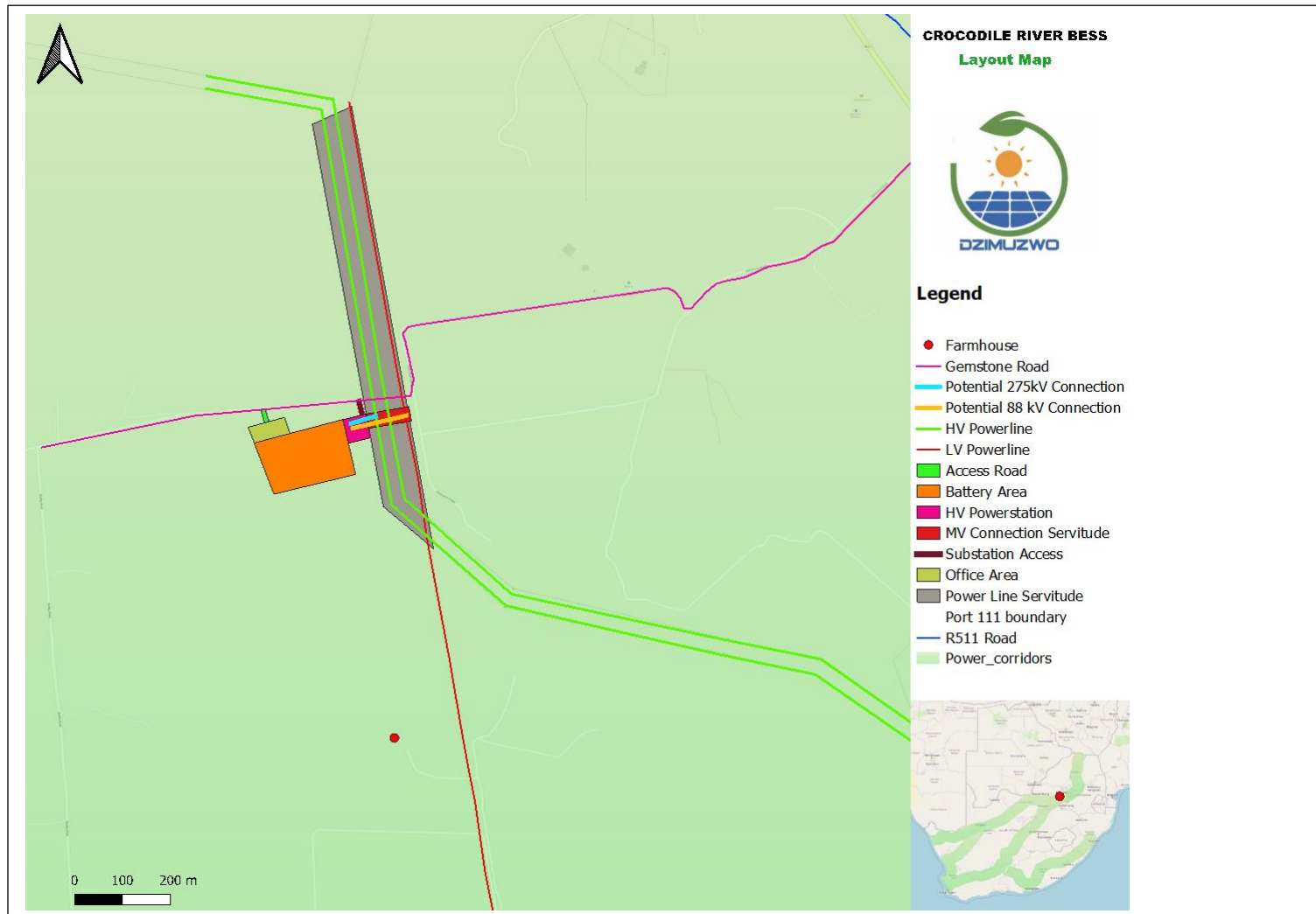


Figure 1:Layout Map for the proposed Battery Energy Storage System (BESS) and associated infrastructure

REGULATORY PROCESS

This project follows a Basic Assessment (BA) legislative process prescribed in the Environmental Impact Assessment (EIA) Regulations 2014 (as amended). This report constitutes the draft Basic Assessment Report (dBAR) which details the environmental outcomes, impacts and residual risks of the proposed activities. The report aims to assess the key environmental issues and impacts associated with the development, and to document Interested and Affected Parties' (I&APs) issues and concerns. Furthermore, it provides background information of the proposed project, a motivation, and details of the proposed project, and describes the public participation undertaken to date. This draft BAR provides an assessment of both the benefits and potential negative impacts anticipated because of the proposed project.

PUBLIC PARTICIPATION PROCESS

The public participation process aims to provide Interested and Affected Parties (I&APs) with information regarding the proposed project and will provide an opportunity to raise any issues or concerns. As part of the public participation process, you are invited to review the draft Basic Assessment Report (dBAR) and comment on the document. The report will be available for review at the following public places:

- **Amahle (Plot 79 Laezonia AH, 17 Main Road, Centurion,**
- **Dzimuzwo website: www.dzimuzwo.co.za/public-disclosure**

Details of the Public Meeting:

- **Date: 07 November 2022**
- **Time: 17:00 for 18:00**
- **Venue: Amahle (Plot 79 Laezonia AH, 17 Main Road, Centurion)**
(Coordinates-25.898430, 28.025896)

The dBAR is now available for review and comment as follows:

- **21 October 2022 – 20 November 2022 (30 calendar days)**

Dzimuzwo Consulting (Pty) Ltd has been appointed as the Environmental Assessment Practitioner (EAP) to conduct this process. I&APs are invited to register by submitting their names,

contact information and interest. Comments on the draft dBAR can also be forwarded to the contact details provided above.

SUMMARY OF SPECIALIST ASSESSMENT PROCESS

The specialist studies undertaken for the project were identified through the DFFE's online screening tool and drafted in accordance with the specialist protocols (GNR 320 of 2020). Below is a summary of their findings:

Impact on Ecological (Flora)

The wider region provides for a physiognomically heterogeneous grassland landscape and ecosystem that is characterised by locally variable broad-scale and micro-habitat types that has their origin from the continuum and interrelationship of slopes, geomorphological attributes, topographical heterogeneity, and moisture regimes. The original (alternative) development footprint is characterised by a homogenous (uniform) grassland community, exhibiting attributes of high floristic sensitivity, and strongly correlating to the regional Carletonville Dolomite Grassland. Although this ecological type is ascribed a Least Threatened conservation status, is considered somewhat limited in distribution and status from a regional perspective. The inherent high floristic sensitivity of the original (alternative) site is greatly enhanced by the presence of several conservation important plant species, within the site as well as in the immediate surrounds (north). The original (alternative) site also overlaps with the required 200m buffer around these species. As such, the proposed development of the original (alternative) site cannot be supported without reasonably anticipating severe and significant impacts on the floristic environment. The mitigation potential of these impacts is furthermore considered low, specifically since ex situ conservation measures are generally not supported.

In contrast, and despite the preferred site exhibiting broadly similar floristic and biophysical traits to the original (alternative) site, the floristic status, and sensitivity, appear slightly perturbed, which is evident from the presence of 'poor quality' grass and forb species. Importantly, no plant species of conservation concern has been recorded from the original preferred site. It is also spatially situated outside the required 200 m buffer around red data species observed near the principal site. Ultimately, this site exhibits floristic attributes of a lower sensitivity and will provide for impacts of a lower (and acceptable) significance level. This assessment therefore strongly recommends, and will support, the use of the preferred site for the proposed development. This opinion is also based on the explicit understanding that the recommended mitigation approach is timeously and comprehensively implemented and adhered to during all stages of the development.

Impact on Fauna and Avifauna

The faunal richness of the area is heavily influenced by the spatial inclusion in the Crocodile River Nature Reserve. Ultimately, the study areas conform to a typical highveld environment, dominated by the dolomitic extrusions and the prevalence of a pristine, or near pristine herbaceous layer with scattered and isolated locally indigenous tree stands. A high ecological connectivity to natural habitat further to the north is noted. The homogenous nature of the topography within the site, as

well as the small size, dictate that the actual faunal species complement will be lower than the wider region, but this does not exclude the opportunistic or periodic presence of conservation important fauna and bird species on the site, albeit mostly for migratory purposes. Marginal differences are noted between habitat conditions of the original (alternative) and preferred sites, with habitat within the alternative site exhibiting slightly deteriorated conditions while habitat from the original (alternative) site is exhibit a high correlation to the regional ecological type. Ecological connectivity of the principal site is also slightly higher than the preferred site because of the proximity to deteriorated areas to the south of the site.

An evaluation of habitat suitability for conservation important fauna and avifauna species that are considered likely, or moderately likely, to persist within the immediate region, indicated a moderate likelihood of occurrence within the principal site, compared to a moderately low likelihood of occurrence in the alternative site. A medium-high faunal sensitivity is ascribed to the original (alternative) site, while the preferred site exhibits attributes of medium sensitivity. An evaluation of anticipated and likely impacts on the faunal and avian constituents and habitat from the respective sites indicated a higher significance from the original (alternative) site is expected. In particular, the loss of pristine and natural habitat, even on a local scale is considered significant. As such, the proposed development on the preferred site will be supported by this study. The recommended mitigation measure, if implemented timeously and comprehensively, is furthermore expected to reduce the significance level of anticipated impacts to an acceptable level.

Impacts on soil and agricultural potential

The site has low agricultural potential predominantly because of soil constraints and as a result the site is unsuitable for crop production. The proposed Crocodile River BESS development site is verified in this assessment as being of less than high agricultural sensitivity. The agricultural impact of the proposed development is the, probably permanent, loss of 3.18 hectares of agricultural land that is currently not used for agricultural production and has very limited future production potential. This impact is assessed as having low significance. The conclusion of this assessment is that the proposed development will not have an unacceptable negative impact on agricultural production capability. The proposed development is acceptable because the land is of limited soil capability and is not suitable for crop production. From an agricultural impact point of view, it is recommended that the development be approved.

Impacts on Heritage Resources

The proposed site is currently fallow and based on historical maps no structures occur in the impact area. The proposed Crocodile Bess development is in a proclaimed nature reserve falling within the Crocodile River Reserve and the Magaliesberg Bioshpere. During the site visit no surface indicators of heritage features were recorded. According to the SAHRA palaeontological sensitivity, the study area is of very high palaeontological significance and was addressed in an independent study (Bamford 2022). The study found that it is extremely unlikely that any fossils would be preserved in the overlying soils and sands of the Quaternary. The impact to heritage

resources is low and the project can commence provided that the recommendations in this report are adhered to, based on the South African Heritage Resource Authority (SAHRA) 's approval.

Impacts on Palaeontology

Based on the fossil record but confirmed by the site visit and walk through there are NO FOSSILS such as stromatolites in the exposed dolomites, even though fossils have been recorded from rocks of a similar age and type in South Africa. It is extremely unlikely that any fossils would be preserved in the overlying soils and sands of the Quaternary. There is a very small chance that fossils may occur in below the ground surface in the dolomites of the Oaktree and Monte Christo Formations, (Malmani Subgroup, Chuniespoort Group, Transvaal Supergroup) so a Fossil Chance Find Protocol should be added to the EMP. If fossils are found by the Environmental Control Officer (ECO), or other responsible person once excavations and drilling have commenced, then they should be rescued, and a palaeontologist called to assess and collect a representative sample.

Impacts on Noise

The potential environmental impact of the proposed project was determined by identifying the environmental aspects and then undertaking an environmental risk assessment to determine the potential significant environmental impacts. The impact assessment included all phases of the project, with specific emphasis on construction and operation. The closest noise sensitive sites will experience a slight change in noise levels (a 6 dB increase) and thus will have a low to medium impact without mitigation. With the noise mitigation implemented, it is expected the noise sensitive sites will not experience a change in noise levels and thus will have a low impact. The construction phase is temporary and typically completed within 12-15 months. If noise mitigation is used, noise nuisance complaints will be reduced significantly, especially during the day-time periods.

Cumulative impacts

The overall cumulative impact significance will be low. There are no identified impacts of unacceptable nature.

Overall, no environmental fatal flaws were identified from an assessment's perspective for the proposed Battery Energy Storage System (BESS) and associated infrastructure refer to the sensitivity map below.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

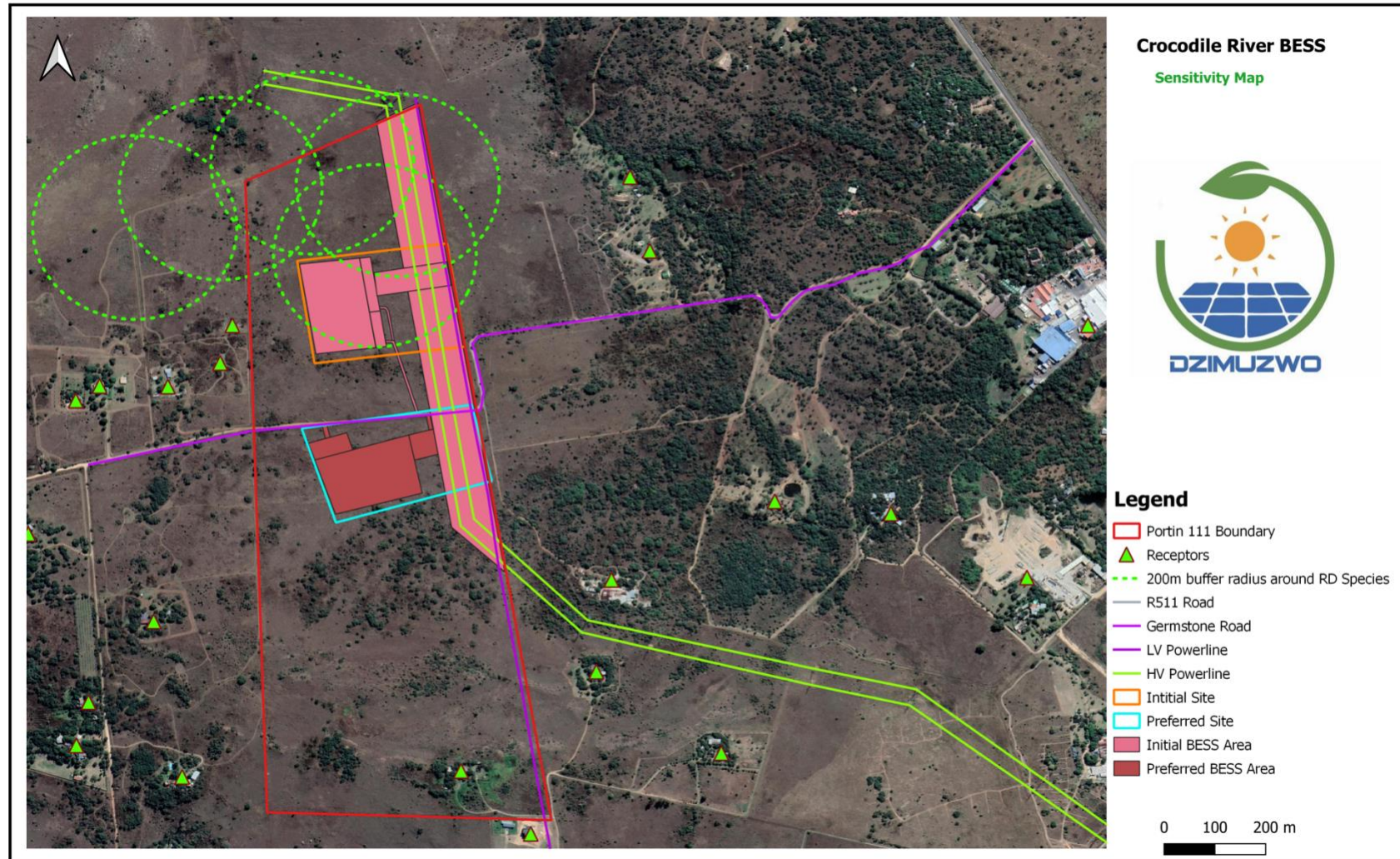


Figure 2:Layout overlain on sensitivity map for the proposed battery Energy Storage System and associated infrastructure

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

DEFINITIONS AND TERMINOLOGY

Activity (Development)	An action either planned or existing that may result in environmental impacts through pollution or resource use. For the purpose of this report, the terms 'activity' and 'development' are freely interchanged.
Alien	A species that is not indigenous to the area or out of its natural distribution range.
Alternatives	Different means of meeting the general purpose and requirements of the activity, which may include site or location alternatives; alternatives to the type of activity being undertaken; the design or layout of the activity; the technology to be used in the activity and the operational aspects of the activity.
Ambient sound level	The reading on an integrating impulse sound level meter taken at a measuring point in the absence of any alleged disturbing noise at the end of a total period of at least 10 minutes after such meter was put into operation.
Applicant	The project proponent or developer responsible for submitting an environmental application to the relevant environmental authority for environmental authorisation.
Assessment	The process of collecting, organising, analysing, interpreting and communicating information which is relevant.
Biodiversity	The diversity of animals, plants and other organisms found within and between ecosystems, habitats, and the ecological complexes.
Biological diversity	The variables among living organisms from all sources including, terrestrial, marine and other aquatic ecosystems and the ecological complexes they belong to.
Buffer	A buffer is seen as an area that protects adjacent communities from unfavourable conditions. A buffer is usually an artificially imposed zone included in a management plan.
Construction	The building, erection or establishment of a facility, structure or infrastructure that is necessary for the undertaking of a listed or specified activity but excludes any modification, alteration or expansion of such a facility, structure or infrastructure and excluding the reconstruction of the same facility in the same location, with the same capacity and footprint.
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.
Cumulative Impact	The impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

Decommissioning	The demolition of a building, facility, structure or infrastructure.
Direct Impact	Impacts that are caused directly by the activity and generally occur at the same time and at the same place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally quantifiable.
Disturbing noise	A noise level that exceeds the ambient sound level measured continuously at the same measuring point by 7 dB or more.
'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.
Ecosystem	A dynamic system of plant, animal (including humans) and micro-organism communities and their non-living physical environment interacting as a functional unit. The basic structural unit of the biosphere, ecosystems are characterised by interdependent interaction between the component species and their physical surroundings. Each ecosystem occupies a space in which macro-scale conditions and interactions are relatively homogenous.
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.
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	In terms of the National Environmental Management Act (NEMA) (Act No 107 of 1998) (as amended), "Environment" means the surroundings within which humans exist and that are made up of: <ul style="list-style-type: none"> i. the land, water and atmosphere of the earth; ii. micro-organisms, plants 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 wellbeing.
Environmental Assessment	The generic term for all forms of environmental assessment for projects, plans, programmes or policies and includes methodologies or tools such as environmental impact assessments, strategic environmental assessments and risk assessments.
Environmental Authorisation	An authorisation issued by the competent authority in respect of a listed activity, or an activity which takes place within a sensitive environment.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

Environmental Assessment Practitioner (EAP)	The individual responsible for planning, management and coordination of environmental impact assessments, strategic environmental assessments, environmental management programmes or any other appropriate environmental instrument introduced through the EIA Regulations.
Environmental Control Officer (ECO)	An individual nominated through the Client to be present on site to act on behalf of the Client in matters concerning the implementation and day to day monitoring of the EMPr and conditions stipulated by the authorities.
Environmental Impact	Change to the environment (biophysical, social and/ or economic), whether adverse or beneficial, wholly or partially, resulting from an organisation's activities, products or services.
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 (EMPr)	A detailed plan of action prepared to ensure that recommendations for enhancing or ensuring positive impacts and limiting or preventing negative environmental impacts are implemented during the life cycle of a project. This EMPr focuses on the construction phase, operation (maintenance) phase and decommissioning phase of the proposed project.
Fatal Flaw	An event or condition that could cause an unanticipated problem and/or conflict which will could result in a development being rejected or stopped.
Groundwater	Water in the ground that is in the zone of saturation from which wells, springs, and groundwater runoff are supplied.
Habitat:	The place in which a species or ecological community occurs naturally.
Hazardous Waste	Any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment and includes hazardous substances, materials or objects within business waste, residue deposits and residue stockpiles as outlined in the National Environmental Management: Waste Amendment Act (No 26 of 2014). Schedule 3: Category A – Hazardous Waste.
Hydrology	The science encompassing the behaviour of water as it occurs in the atmosphere, on the surface of the ground, and underground.
Indirect Impacts	Indirect or induced changes that may occur as a result of the activity. These types if impacts include all of the potential impacts that do not manifest immediately when the activity is undertaken, or which occur at a different place as a result of the activity
Indigenous:	All biological organisms that occurred naturally within the study area prior to 1800.
Incident:	An unplanned occurrence that has caused, or has the potential to cause, environmental damage
Indirect impacts:	Indirect or induced changes that may 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.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

Integrated Environmental Management	A philosophy that prescribes a code of practice for ensuring that environmental considerations are fully integrated into all stages of the development and decision-making process. The IEM philosophy (and principles) is interpreted as applying to the planning, assessment, implementation, and management of any proposal (project, plan, programme or policy) or activity - at local, national and international level – that has a potentially significant effect on the environment. Implementation of this philosophy relies on the selection and application of appropriate tools for a particular proposal or activity. These may include environmental assessment tools (such as strategic environmental assessment and risk assessment), environmental management tools (such as monitoring, auditing, and reporting) and decision-making tools (such as multi-criteria decision support systems or advisory councils).
Interested and Affected Party (I&AP)	Any person, group of persons or organisation interested in or affected by an activity; and any organ of state that may have jurisdiction over any aspect of the activity.
Method Statement	A method statement is a written submission by the Contractor to the Engineer in response to the specification or a request by the Engineer, setting out the plant, materials, labour, and method the Contractor proposes using to carry out an activity, identified by the relevant specification or the Engineer when requesting a Method Statement. It contains sufficient detail to enable the Engineer to assess whether the Contractor's proposal is in accordance with the Specifications and/or will produce results in accordance with the Specifications.
Mitigate	The implementation of practical measures designed to avoid, reduce or remedy adverse impacts or enhance beneficial impacts of an action.
No-Go Option	In this instance the proposed activity would not take place, and the resulting environmental effects from taking no action are compared with the effects of permitting the proposed activity to go forward.
Pre-construction	The period prior to the commencement of construction, which may include activities which do not require Environmental Authorisation (e.g. geotechnical surveys).
Pollution	The National Environmental Management Act, No. 107 of 1998 defines pollution to mean any change in the environment caused by – substances; radioactive or other waves; or noise, odours, dust or heat emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future.
Public Participation Process	A process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to, specific matters.
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

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

	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).
Re-use	To utilise articles from the waste stream again for a similar or a different purpose without changing the form of properties of the articles.
Rehabilitation	A measure aimed at reinstating an ecosystem to its original function and state (or as close as possible to its original function and state) following activities that have disrupted those functions.
Sensitive Environments	Any environment identified as being sensitive to the impacts of the development.
Significance	Significance can be differentiated into impact magnitude and impact significance. Impact magnitude is the measurable change (i.e., magnitude, intensity, duration and likelihood). Impact significance is the value placed on the change by different affected parties (i.e., level of significance and acceptability). It is an anthropocentric concept, which makes use of value judgements and science-based criteria (i.e., biophysical, social and economic).
Stakeholder Engagement	The process of engagement between stakeholders (the proponent, authorities, and I&APs) during the planning, assessment, implementation and/or management of proposals or activities.
Sustainable Development	Development which meets the needs of current generations without hindering future generations from meeting their own needs.
Visual Contrast	The degree to which the development would be congruent with the surrounding environment. It is based on whether or not the development would conform with the land use, settlement density, forms and patterns of elements that define the structure of the surrounding landscape.
Waste:	Any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to the Waste Amendment Act (as amended on June 2014); or any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette.
Watercourse	Defined as:

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

	<ul style="list-style-type: none"> i. a river or spring; ii. a natural channel or depression in which water flows regularly or intermittently; iii. a wetland, lake, or dam into which, or from which, water flows; and iv. any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse as defined in the National Water Act, 1998 (Act No. 36 of 1998) and a reference to a watercourse includes, where relevant, its bed and banks.
Water Pollution	The National Water Act, 36 of 1998 defined water pollution to be the direct or indirect alteration of the physical, chemical or biological properties of a water resource so as to make it – less fit for any beneficial purpose for which it may reasonably be expected to be used; or harmful or potentially harmful (aa) to the welfare, health or safety of human beings; (bb) to any aquatic or non-aquatic organisms; (cc) to the resource quality; or (dd) to property”.
Wetland	Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

ACRONYMS

AC	Alternating Current
BA	Basic Assessment
BAR	Basic Assessment Report
BESS	Battery Energy Storage System
BID	Background Information Document
CA	Competent Authority
CBA	Critical Biodiversity Area
CV	Curriculum Vitae
DBAR	Draft Basic Assessment Report
DC	Direct Current
DEFF	Department of Environment, Fisheries and Forestry
DHSW&S	Department of Human Settlements, Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioner Association of South Africa
ECO	Environmental Control Officer
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EP	Equator Principles
EPFI	Equator Principles Financial Institutions
EWT	Endangered Wildlife Trust
GA	General Authorisation
GIS	Geographic Information System
GNR	Government Notice Regulation
I&AP	Interested and Affected Party
IFC	International Finance Corporation
IDP	Integrated Development Plan
IRP	Integrated Resources Plan
IEM	Integrated Environmental Management

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

MW	Megawatt
NCDENC	Northern Cape Department of Environment and Nature Conservation
NEMA	National Environmental Management Act (Act No. 107 of 1998)
NEM:AQA	National Environmental Management Air Quality Act (Act No. 39 of 2004)
NEM:BA	National Environmental Management Biodiversity Act (Act No. 10 of 2004)
NEM:PAA	National Environmental Management Protected Areas Act (Act No. 57 of 2003)
NEM:WA	National Environmental Management – Waste Act (Act No. 59 of 2008)
NFA	National Forests Act (Act No. 84 of 1998)
NGO	Non-Governmental Organisation
NHRA	National Heritage Resources Act (Act No. 25 of 1999)
NWA	National Water Act (Act No. 36 of 1998)
OHSA	Occupational Health and Safety Act (Act No 85 of 1993)
PES	Present Ecological State
PPP	Public Participation Process
PS	Performance Standards
REC	Recommended Ecological Category
REDZ	Renewable Energy Development Zone
SACNASP	South African Council of Natural Science Professionals
SDG	Sustainable Development Goals
SWMP	Stormwater Management Plan
UNFCCC	United Nations Framework Convention on Climate Change
WUA	Water Use Authorisation

Table of Contents

CHAPTER 1: INTRODUCTION.....	1
1.1. Structure of the Basic Assessment Report (BAR)	1
1.2. Applicant's Details	1
1.3. Specialist Assessments	1
1.4. Details of the Environmental Assessment Practitioner (EAP)	1
CHAPTER 2: PROJECT OUTLINE	3
2.1. Project description.....	3
2.2. The legal requirement for the proposed project as per the 2014 EIA Regulations (as amended)	8
2.3. Project alternatives.....	12
2.3.1. Layout alternative	12
2.3.2. Technology alternative.....	15
2.3.3. Grid connection alternatives.....	17
2.3.4. BESS Usage alternatives	17
2.4. No-go alternative.....	18
2.5. Need and desirability	18
2.5.1. National need and desirability	18
2.5.2. Project capability to meet the need and desirability.....	20
2.6. Socio-economic benefits	20
CHAPTER 3: APPLICABLE REGULATORY CONTEXT.....	22
3.1. International regulatory framework	22
3.2. Equator Principles	35
3.2.1. Principle 1: Review and Categorization	35
3.2.2. Principle 3: Applicable Social and Environmental Standards.....	36
3.2.3. Principle 9: Independent Monitoring and Reporting.....	36
3.2.4. Principle 10: Reporting and Transparency	36

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

3.1. Host country's regulatory framework	37
CHAPTER 4: APPROACH TO THE BASIC ASSESSMENT PROCESS	45
4.1. Overview of the Basic Assessment process	45
4.2. Summary of the Screening Tool	46
4.3. Summary of the Pre-application Process.....	47
4.4. Stakeholder Engagement (Public participation) Process	47
4.4.1. Public participation process	49
4.4.2. Comments and Response.....	52
CHAPTER 5: THE RECEIVING ENVIRONMENT.....	64
5.1. Geographical setting	64
5.2. Physical aspect.....	65
5.2.1. Geology	65
5.2.2. Topography, relief and slopes.....	67
5.3. Biological aspect	69
5.3.1. Landcover and Land-use	69
5.3.2. Soils and agricultural potential	71
5.3.3. Wetlands and surface hydrology	73
5.3.4. Biodiversity (Flora)	75
5.3.5. Fauna and avifauna	79
5.4. Cultural aspect.....	82
5.4.1. Heritage.....	82
5.4.2. Palaeontology.....	82
5.5. Noise.....	83
5.6. Social aspect.....	85
5.6.1. Population	85
5.6.2. Demographics	86
5.6.3. Education.....	87
5.6.4. Economic Base	88
5.6.5. Unemployment	89

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

CHAPTER 6: PROJECT'S IMPACT ASSESSMENT	90
6.1. Identification and evaluation of potential impacts	91
6.2. Determination of significance of impacts	92
6.3. Biodiversity	95
6.3.1 Direct Impacts.....	95
6.3.2 Indirect Impacts.....	98
6.3.3. Beneficial Impacts.....	100
6.3.4. Adverse Impacts	100
6.3.5. Event Related Impacts	101
6.4. Soil and agricultural potential	102
6.5. Heritage.....	103
6.6. Palaeontology.....	103
6.7. Noise.....	104
CHAPTER 7: PROJECT'S CUMULATIVE IMPACTS.....	107
CHAPTER 8: IMPACT STATEMENT AND RECOMMENDATIONS	109
8.1. Impact statement	109
8.1.1. Biodiversity.....	109
8.1.2. Faunal and Avifauna.....	109
8.1.3. Soil and agricultural potential	110
8.1.4. Heritage.....	110
8.1.5. Palaeontology.....	111
8.1.6. Noise.....	111
8.2. EAP's Recommendations.....	111
CHAPTER 9: REFERENCES.....	113

FIGURES

Figure 1:Layout Map for the proposed Battery Energy Storage System (BESS) and associated infrastructure	iv
---	----

Figure 2:Layout overlain on sensitivity map for the proposed battery Energy Storage System and associated infrastructure.....	ix
Figure 3: Locality Map for the proposed battery Energy Storage System and associated infrastructure.....	4
Figure 4: Narada's grid-scale BESS (source: Narada Power Source Co. Ltd, 2018).....	5
Figure 5: Example of a 29 MW BESS located in Aylesford, UK (Source: Eskom 2018). ..	6
Figure 6:Layout Map for the proposed Battery Energy Storage System (BESS) and associated infrastructure	7
Figure 7: Close-up google-earth layout Map for the proposed BESS and associated infrastructure.....	8
Figure 8: Alternative sites layout map for the proposed BESS and associated infrastructure.....	14
Figure 9: Illustration of a lithium-ion battery (source: https://goenergylink.com/blog/key-differences-between-lithium-ion-and-lithium-iron-batteries/).....	15
Figure 10: Illustration of a Lead-acid battery (source: https://panbo.com/a-guide-to-understanding-boat-batteries-part-1-lead-acid/).....	16
Figure 11: Illustration of a Sodium-Sulfur battery (Source: NGK Insulators Ltd).....	16
Figure 12: Illustration of a flow-battery (source: <i>Electronics</i> 2020 , 9, 1567. https://doi.org/10.3390/electronics9101567)	17
Figure 13: Transmission corridors (EGIS)	45
Figure 14: Locality map of City of Tshwane	64
Figure 15: Project site overlain on the geological map	66
Figure 16: Project site overlain on the topographical map.....	68
Figure 17: Project site overlain on the Land use map.....	70
Figure 18: Project site overlain on the soil and agricultural potential map	72
Figure 19: A surface water map highlighting watercourses around the project site.....	74
Figure 20: Terrestrial biodiversity sensitivity theme (Environmental Screening Report, 2022/06/10).....	77
Figure 21: Red Data locations and required GDARD buffers	78
Figure 22: Important Bird Areas in relation to the study area	81
Figure 23: Palaeontological map of the project site	83

Figure 24: Simulation of the noise levels from the preferred site.....	85
Figure 25: Region 4 locality map	86
Figure 26: Region 4 locality map	87
Figure 27: Educational profile for Region 4	88
Figure 28: Unemployment rate per region within the City of Tshwane.....	89

TABLES

Table 1: Applicant's details	1
Table 2: Specialist assessments conducted for the project	1
Table 3: EAP's details	2
Table 4: Listed activities triggered by the proposed project as per the 2014 EIA regulations (as amended).....	9
Table 5: IFC requirements.....	22
Table 6: Prediction of the Construction Noise at the closest noise sensitive receptors.	83
Table 7: Simulation of the existing noise levels from the Proposed Alternative Site	84
Table 8: Environmental/social sensitivity	91
Table 9: Definition of impact significance.....	92
Table 10: Criteria for determining significance of impacts.....	93
Table 11: Criteria for magnitude of impacts	94

APPENDICES

Appendix A: Maps

Appendix B: Specialist studies

Appendix C: EAP's CV

Appendix D: Competent authority correspondence

Appendix E: Screening tool reports (preferred and alternative site)

Appendix F: Public participation report

Appendix G: Draft EMPr (BESS & associated infrastructure)

Appendix H: Generic EMPr (Substation infrastructure)

Appendix I: Generic EMPr (Power line infrastructure)

Appendix J: EAP's declaration of interest

CHAPTER 1: INTRODUCTION

A Basic Assessment (BA) process is the level of environmental assessment applicable to activities listed in Listing Notices 1 and 3. A BA is applied to activities that are considered less likely to have significant environmental impacts and, therefore, unlikely to require a detailed Environmental Impact Assessment (EIA).

The BA aims to achieve the following:

- ❑ Determine the policy and legislative context within which the proposed activity is undertaken and how the activity complies with and responds to the policy and legislative context;
- ❑ Describe the need and desirability of the proposed project;
- ❑ Identify the alternatives considered, including the activity, location, and technology alternatives;
- ❑ Undertake an impact and risk assessment process inclusive of reasonably foreseeable cumulative impacts (where applicable). The focus being; determining the geographical, physical, biological, social, economic, heritage and cultural sensitivity of the project and the risk of impact of the proposed activity on these aspects to determine the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and the degree to which these impacts:
 - can be reversed;
 - may cause irreplaceable loss of resources; and
 - can be avoided, managed or mitigated.

This draft Basic Assessment Report (dBAR) has been compiled in accordance with the stipulated requirements in GNR 326, Appendix 1 of the EIA Regulations, 2014 (as amended in 2017), which outlines the legislative BA process and requirements for assessment of outcomes, impacts and residual risks of the proposed development. The dBAR further incorporates the findings and recommendations of the specialist studies conducted for the project. An Environmental Management Programme (EMPr) has been compiled according to Appendix 4 of GNR 326 of the EIA Regulations, 2014 (as amended in 2017) for the construction and rehabilitation phases of the project. The EMPr has been compiled as a stand-alone document from the dBAR and is submitted to the DFFE along with the dBAR. The EMPr provides the actions for the management of identified environmental impacts emanating from the project and a detailed outline of the implementation programme to minimise and/ or eliminate any anticipated negative environmental impacts and to enhance positive impacts. The EMPr provides strategies to be used to address the roles and responsibilities of environmental management personnel on site, and a framework for environmental compliance and monitoring.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

1.1. Structure of the Basic Assessment Report (BAR)

APPENDIX 1: NEMA REQUIREMENTS FOR A BASIC ASSESSMENT REPORT		
Appendix 1	CONTENT OF BASIC ASSESSMENT REPORTS	CHAPTER/ SECTION
3(1)	Details of <ul style="list-style-type: none"> i) the EAP who prepared the report; and ii) the expertise of the EAP to carry out an environmental impact assessment 	Chapter 1
	The location of the activity (21-digit Surveyor General code, physical address and farm name where available, coordinates of the boundary of the property)	Chapter 2
	A plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale or, if it is – a linear activity, a description of the route of the activity.	Chapter 2
	A description of the scope of the proposed activity, including – <ul style="list-style-type: none"> i) all listed and specified activities triggered and being applied for; and ii) a description of the activities to be undertaken including associated structures and infrastructure. 	Chapter 2
	A description of the policy and legislative context within which the development is proposed including – <ul style="list-style-type: none"> i) 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; and ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments. 	Chapter 3
	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.	
	A motivation for the preferred site, activity and technology alternative.	Chapter 2
(h)	<ul style="list-style-type: none"> i) A full description of the process followed to reach the proposed preferred alternative within the site. ii) details of all the alternatives considered; iii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; 	Chapter 2, 4, 5 and 6

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

	<ul style="list-style-type: none"> iv) 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; v) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; vi) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts – Error! Reference source not found. <ul style="list-style-type: none"> a. (aa) can be reversed; b. (bb) may cause irreplaceable loss of resources; and c. (cc) can be avoided, managed or mitigated. vii) 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. 	
(i)	<p>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 –</p> <ul style="list-style-type: none"> 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. 	Chapter 6
(j)	<p>An assessment of each identified potentially significant impact and risk including –</p> <ul style="list-style-type: none"> 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 may cause irreplaceable loss of resources; and vii) the degree to which the impact and risk can be avoided, managed or mitigated. 	Chapter 7
(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.	
(l)	<p>An environmental impact statement which contains-</p> <ul style="list-style-type: none"> i) a summary of the key findings of the environmental impact assessment; 	Chapter 8

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

	<p>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</p> <p>iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.</p>	
(m)	Based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr.	Appendix G,H and I
(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.	Chapter 8
(o)	A description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed.	Chapter 8
(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.	
(q)	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised.	Appendix
(r)	<p>An undertaking under oath or affirmation by the EAP in relation to:</p> <p>i) the correctness of the information provided in the reports;</p> <p>ii) the inclusion of comments and inputs from stakeholders and I&APs;</p> <p>iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties.</p>	Chapter 8
(s)	Where applicable, details of any financial provisions for the rehabilitation, closure, and on-going post decommissioning management of negative environmental impacts.	Not defined as yet
(t)	Any specific information that may be required by the competent authority.	N/A
(u)	Any other matters required in terms of section 24(4)(a) and (b) of the Act.	

1.2. Applicant's Details

The details of the applicant are highlighted in the table below.

Table 1: Applicant's details

Applicant	Crocodile Reserve Energy Storage (Pty) Ltd
Representative	Steven Wynter
Physical Address	18, Beech Str, Tokai, Cape Town, 7966
Mobile	+27 82 822 6358
E-mail	Steve@gridflexsa.com

1.3. Specialist Assessments

To ensure the scientific thoroughness of the BA process and an informed assessment of impacts, Dzimuzwo, through the Applicant, commissioned the following specialist studies undertaken during the project's preliminary phase. The specialist reports are appended as part of the report in **Appendix B**.

Table 2: Specialist assessments conducted for the project

Specialist Reports	Name & Organisation	Appendix
Biodiversity (Flora & Fauna)	Riaan Robberson & Lukas Niemand from Bathusi Environmental Consulting (BEC)	Appendix_B1
Soils and Agricultural Potential	Johann Lannz (Independent Consultant)	Appendix_B2
Heritage	Jaco van der Walt & Ruan van der Merwe from Beyond Heritage	Appendix_B3
Palaeontology	Professor Marion Bamford	Appendix_B4
Noise	Duduzile Skhosana & Oliver Knopersen from Acoustech Consulting (Pty) Ltd	Appendix_B5

1.4. Details of the Environmental Assessment Practitioner (EAP)

According to Section 24H Registration Authority Regulations, 2016 under GN 849 (as amended) read with Section 13 of the 2014 EIA regulations (as amended), only a registered independent Environmental Assessment Practitioner (EAP) is required to undertake an EIA process. Following the regulatory framework, Crocodile Reserve Energy Storage (Pty) Ltd has appointed Dzimuzwo Consulting (Pty) Ltd as an Environmental Consultant to undertake the appropriate environmental assessment for the proposed project.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

Table 3: EAP's details

Environmental Consultant	Dzimuzwo Consulting (Pty) Ltd
Contact person	Lusani Madali
Physical Address	5 Terenure Road, Kempton Park, 1619
Telephone	+27 64 522 2066
E-mail	Lusani.madali@dzimuzwo.co.za
Qualifications and relevant experience of the project team	<p>Lusani Madali holds a Bachelor of Science Honours degree in Environmental Management and Analysis. She has over ten (10) years of experience developing renewable energy projects in Southern Africa. She is accredited by the Environmental Assessment Practitioners Association of South Africa (EAPASA) as an Environmental Assessment Practitioner (EAP) and the South African Council for Natural Scientific Professions (SACNSP) as a Professional Natural Scientist (Pr.Sc.Nat.).</p> <p>Mulanga Mandiwana is a junior Environmental Consultant. She holds a Bachelor's degree in Environmental and Resources Studies from the University of Limpopo. Her area of expertise is Geographical Information Systems (GIS), implementation of Environmental management plans and systems.</p>

Refer to **Appendix C** for the project team's resumes.

CHAPTER 2: PROJECT OUTLINE

2.1. Project description

Crocodile Reserve Energy Storage (Pty) Ltd is proposing the development of a Battery Energy Storage System (BESS) and associated infrastructure on Portion 111 (A Portion of 19) of the Farm Doornrandje 386J.R. in Pretoria Rural, Gauteng Province within the Crocodile River Reserve Doornrandje Cluster (refer to the locality map below). The isolated site is approximately 10km northeast of Lanseria Airport and 8.1 km north of the Diepsloot residential area.

The Project will comprise associated infrastructure that will include:

- ☐ Transformer/s that will convert low voltage AC to medium/high voltage AC for connection to the grid;
- ☐ An 11-33KV to 88KV or 275kV substation located on the site with associated switching and protection gear and metering equipment;
- ☐ Mounting platforms for the BESS containers;
- ☐ Electrical cabling to interconnect the BESS containers;
- ☐ Auxiliary power supply infrastructure (from the grid and photovoltaic panels) of up to 2,5MW;
- ☐ Low voltage electrical reticulation system;
- ☐ Internal access roads (4m – 6m wide) are located within site;
- ☐ Fencing of approximately 3m in height around the site and substation area;
- ☐ Infrastructure within the site comprising office buildings, warehouses, parking and a laydown area;
- ☐ Instrumentation and Control systems containing hardware and software for remote plant monitoring and operations;
- ☐ Connection to the grid via:
 - An 88KV or 275kV overhead line of approximately 250m connecting the substation to the Eskom grid; or
 - An 88KV or 275kV underground cable of approximately 250m connecting the substation to the Eskom grid
- ☐ Two access roads (6m wide) of approximately 350m in length each to access the site and substation area; and
- ☐ One or more water tanks for construction and or operational phase water usage.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

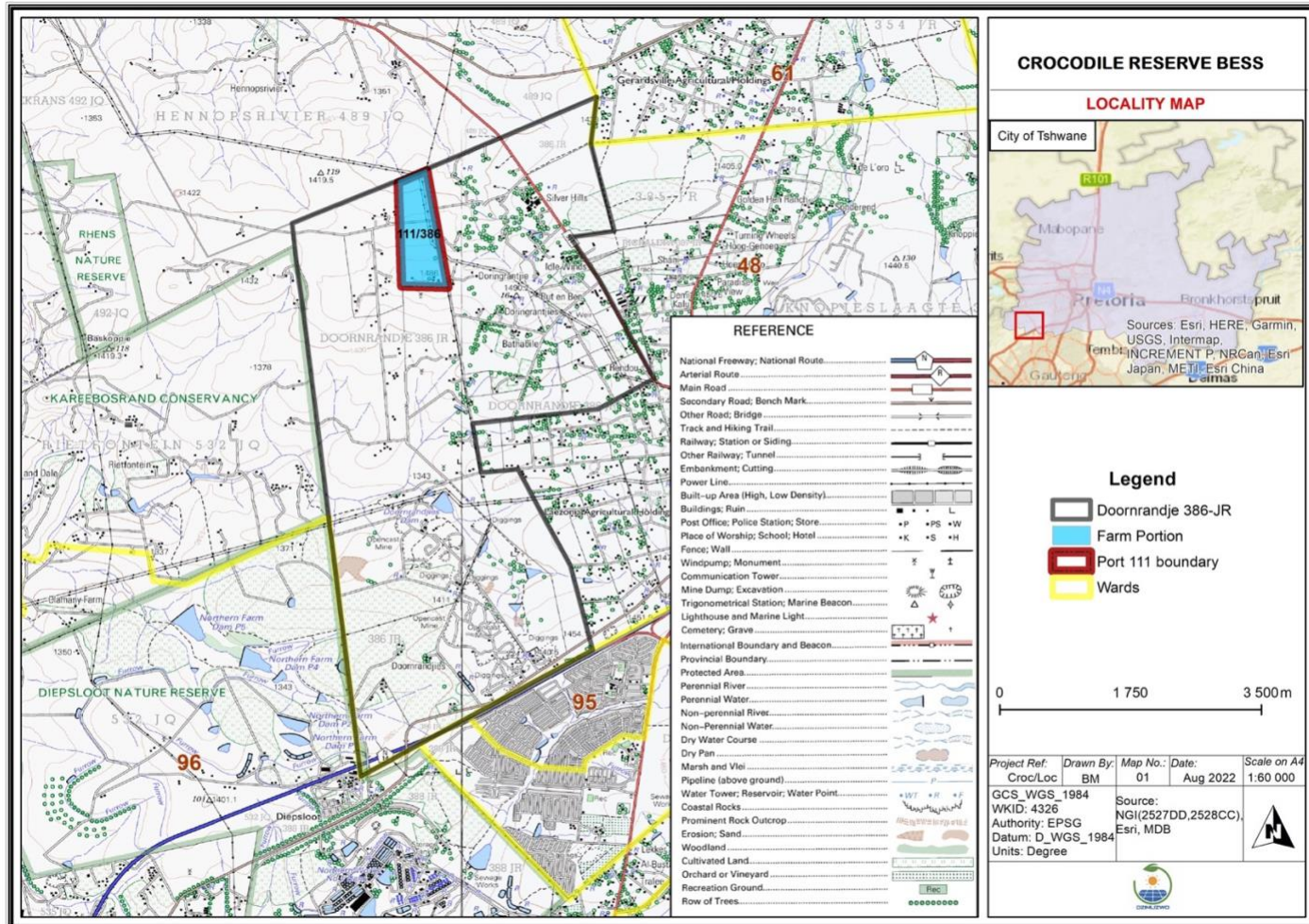


Figure 3: Locality Map for the proposed battery Energy Storage System and associated infrastructure

The Project will have an output capacity of 200 MW / 800 MWh and will utilise a Lithium-Ion (Li-Ion) BESS. The BESS will be charged utilising electricity from the grid during periods of low system demand (typically between 22:00 and 05:00) and discharge energy to the grid during periods of high system demand (typically between 17:00 and 21:00). In a country like South Africa looking to roll out large-scale renewable energy by 2030, the overall benefit of BESS is that it will make renewable energy more reliable and thus more feasible. It is known that the supply of solar and wind power can fluctuate, so BESS is crucial in “smoothing out” this flow to provide a stable power supply of energy when it's needed around the clock. The Project will comprise multiple (approximately 200) such units or containers that will be interconnected with each other. A typical BESS installation is shown in the two figures below.



Figure 4: Narada's grid-scale BESS (source: Narada Power Source Co. Ltd, 2018)



Figure 5: Example of a 29 MW BESS located in Aylesford, UK (Source: Eskom 2018)

Li-Ion batteries are solid-state batteries and include lithiated metal oxides as the cathode. Since the components are in solid form and sealed, the risk of accidental spillage to the environment is very low. However, they are considered hazardous substances (e.g., flammable and corrosive). The quantity of hazardous substances proposed for the Project will be approximately 4000 m³. The BESS consists of several rechargeable Li-Ion batteries, each comprising of one or more electrochemical cells. The batteries are connected into modules which are then connected to form battery packs. Several battery packs are containerised to form a unit the basic components in such a unit/container will comprise:

- Battery packs are made up of several modules.
- A battery management system for controlling, monitoring and protecting battery cells, including the prevention of over or under-charging.
- A power conversion system containing an inverter is required to convert the direct current (DC) from the batteries to alternating current (AC) to feed to the grid; and
- Colling and fire suppression systems.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

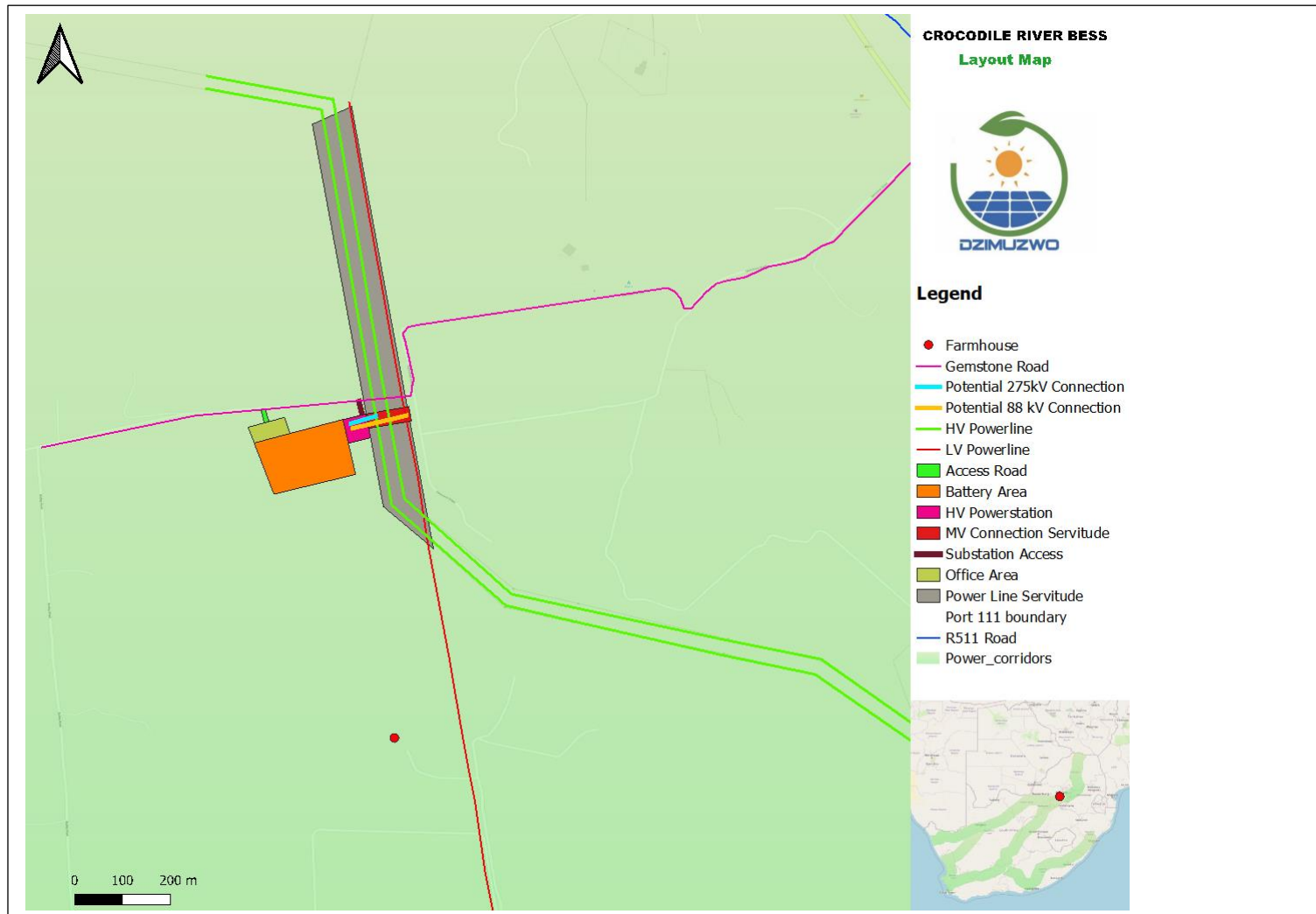


Figure 6:Layout Map for the proposed Battery Energy Storage System (BESS) and associated infrastructure

From an electricity supply infrastructure perspective, it is most effective and efficient to locate generation capacity close to a load. Since the Project is primarily designed to provide peaking power capacity, the selected site is electrically close to a hub of peaking capacity load requirement in the country i.e., within the Tshwane area. Furthermore, the selected site is close to Eskom's distribution and transmission infrastructure, thereby significantly reducing the development footprint required to evacuate power to the grid, as can be seen in the figure below.

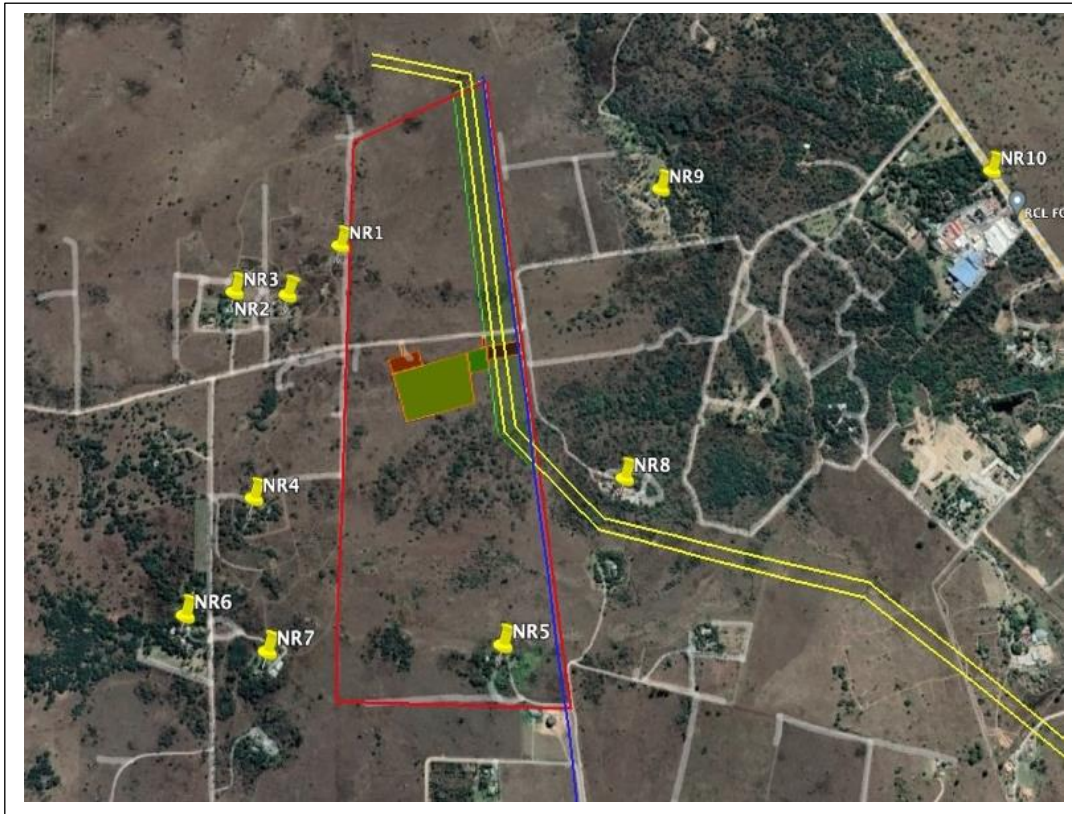


Figure 7: Close-up google-earth layout Map for the proposed BESS and associated infrastructure

2.2. The legal requirement for the proposed project as per the 2014 EIA Regulations (as amended)

This section gives an insight into the proposed project relative to the regulatory framework. In accordance with the 2014 EIA regulations (as amended), the proposed project will trigger listed activities as detailed in the table below.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

Table 4: Listed activities triggered by the proposed project as per the 2014 EIA regulations (as amended)

Activity No(s):	Provide the relevant Basic Assessment Activity(ies) as set out in Listing Notice 1 of the EIA Regulations, 2014 as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
11	The development of facilities or infrastructure for the transmission and distribution of electricity— (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or	The proposed project will comprise an 11-33KV to 88kV substation and power line located on the site with associated switching and protection gear and metering equipment. The project will assess two options to which Eskom will confirm point one which is feasible.
27	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation	The proposed development will require clearance of indigenous vegetation of up to 3 ha to accommodate the BESS.
28	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation 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 proposed project is located on a property previously used for agriculture and now forms part of the crocodile reserve.
Activity No(s):	Provide the relevant Scoping and EIA Activity(ies) as set out in Listing Notice 2 of the EIA Regulations, 2014 as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
4	The development and related operation of facilities or infrastructure, for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.	The proposed project will comprise a BESS infrastructure which will house electrolytes which are considered dangerous goods. These electrolytes will be containerised with a capacity of up to 4000m3 of hazardous substance depending on the battery technology to be utilised.
9	The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex excluding the development of	The proposed project will comprise an 11-33KV to 275kV substation and power line located on the site with associated switching and protection gear and metering

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

	<p>bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is —</p> <p>(a) temporarily required to allow for maintenance of existing infrastructure;</p> <p>(b) 2 kilometres or shorter in length;</p> <p>(c) within an existing transmission line servitude; and</p> <p>(d) will be removed within 18 months of the commencement of development.</p>	<p>equipment The project will assess two options to which Eskom will confirm point one which is feasible.</p>
Activity No(s):	Provide the relevant Basic Assessment Activity(ies) as set out in Listing Notice 3 of the EIA Regulations, 2014 as amended	Describe the portion of the proposed project to which the applicable listed activity relates.
4	<p>The development of a road wider than 4 metres with a reserve less than 13,5 metres.</p> <p>c A protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>ii. National Protected Area Expansion Strategy Focus Areas;</p> <p>iii. Gauteng Protected Area Expansion Priority Areas;</p> <p>This gazette is also available free online at www.gpwonline.co.za 82 No. 40772 GOVERNMENT GAZETTE, 7 APRIL 2017</p> <p>iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans;</p> <p>v. Sites identified within threatened ecosystems listed in terms of the National Environmental Management Act: Biodiversity Act (Act No. 10 of 2004);</p> <p>vi. Sensitive areas identified in an environmental management framework adopted by the relevant environmental authority; reserves in</p>	<p>The proposed development will require the development of a road wider than 4 metres with a reserve of less than 13.5 metres within areas of sensitivity in Gauteng.</p>

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

	<p>terms of the Nature Conservation Ordinance (Ordinance 12 of 1983) or the NEMPAA;</p> <p>xi. Sites designated as nature reserves in terms of municipal Spatial Development Frameworks; or</p> <p>xii. Sites zoned for conservation use or public open space or equivalent zoning.</p>	
12	<p>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</p> <p>c. Gauteng</p> <p>i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;</p> <p>ii. Within Critical Biodiversity Areas or Ecological Support Areas identified in the Gauteng Conservation Plan or bioregional plans; or</p> <p>iii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.</p>	The proposed development will require the clearance of more than 300 square metres of indigenous vegetation with area of sensitivity in Gauteng.
15	<p>The transformation of land bigger than 1000 square metres in size, to residential, retail, commercial, industrial or institutional use, where, such land was zoned open space, conservation or had an equivalent zoning, on or after 02 August 2010.</p> <p>b. Gauteng</p> <p>i. All areas.</p>	The project site is for the proposed development is currently a conservation area and the project will require the transformation of up to 3ha to accommodate the project.

As detailed in the table above, the proposed project triggers listed activities from all three Listing Notices i.e., 1, 2 and 3. The EIA regulations state that if a proposed project triggers listed activities from Listing Notice 2, such project should be assessed via a full scoping and EIA process. However, the proposed project falls within the central transmission corridor as identified in terms of Section 24(2)(a) of the National Environmental Management Act (Ac 107 of 1998) when occurring in geographic areas of strategic importance.

As per GNR 113 dated 16 February 2018, "Applications for an environmental authorisation for large scale electricity transmission and distribution facilities, when such facilities trigger activity 9 of the Environmental Impact Assessment Regulations Listing Notice 2 of 2014 and any other listed and specified activities necessary for the realisation of such facilities, and where the greater part of the proposed facility is to occur in one or more such Strategic Transmission Corridors, must follow the basic assessment procedure contemplated in Regulation 19 and 20 of the Environmental Impact Assessment Regulations, 2014 in order to obtain environmental authorisation, as required in terms of the Act". The timeframe for decision making as contained in the Environmental Impact Assessment Regulations, 2014 for purposes of the applications for environmental authorisation contemplated in this Notice is 57 days".

Whilst the proposed project triggers the listed activities from Listing Notice 2, it is **exempted** from undertaking a full scoping EIA process. Again, the Competent Authority's review period **is further reduced to 57 days**. Following this, the proposed project **will follow a Basic Assessment process** refer to **Appendix D** highlighting the competent authority's acknowledgement of the application and the process to be followed.

2.3. Project alternatives

BESS is a cutting-edge technological solution that allows the storage of energy in multiple ways for later use. Intelligent battery software uses algorithms to coordinate energy production and computerised control systems are used to decide when to keep the energy to provide reserves or release it to the grid. Energy is released from the BESS during times of peak demand, keeping costs down and electricity flowing. Batteries receive electricity from the power grid, straight from the power station, or from a renewable energy source like solar panels, and subsequently store it as current to then discharge it when it is needed.

2.3.1. Layout alternative

The overall development footprint of the proposed BESS and associated infrastructure is expected to be within a 3,5ha in extent. Various locations were considered by the Applicant for the proposed development based on various requirements ranging from land availability, connection to the grid and access to the site. In this regard, the Applicant's preferred site from the

development was the north side. Yet, during the assessment phase, the biodiversity specialist study indicated that this layout is close to highly sensitive species and as such, cannot recommend that the project be developed in this location. **The proposed development was relocated to a least sensitive site, which is now the preferred option, as depicted in the layout map below.**

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

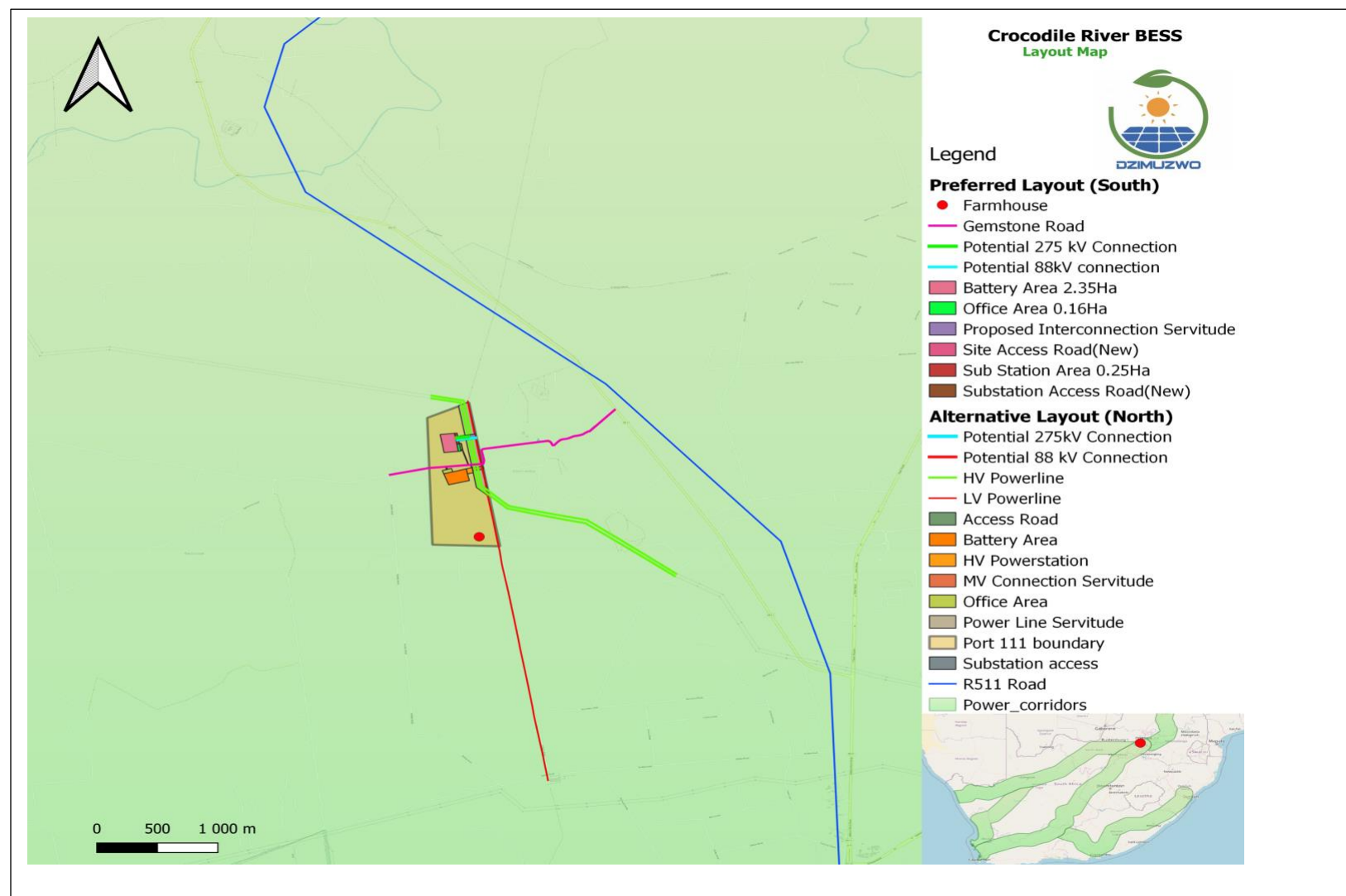


Figure 8: Alternative sites layout map for the proposed BESS and associated infrastructure

2.3.2. Technology alternative

2.3.2.1. Lithium-ion

Lithium-ion is a BESS technology that utilises rechargeable batteries to store energy and then make it available when required. Li-ion battery chemistries comprise lithium cobalt oxide, lithium manganese oxide, lithium iron phosphate, lithium nickel manganese cobalt oxide (NMC), and others. The advantages of a Li-ion battery make it one of the leading technologies facilitating energy storage. It's light and compact, has high capacity and energy density, low maintenance, and a long lifetime. In addition, lithium-ion batteries are easily and quickly charged and have a low self-discharge rate. The weak points of this battery technology include high cost, in flammability, and intolerance to extreme temperatures, overcharge, and over-discharge. This type of rechargeable battery is widely popular in electric vehicles, consumer electronics, and portables, such as smartphones, laptops, tablets, and cameras.

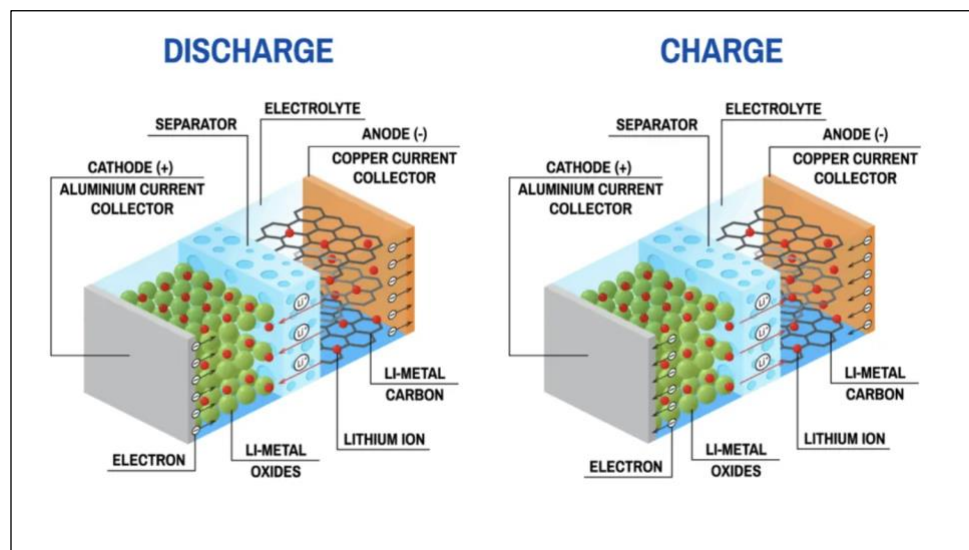


Figure 9: Illustration of a lithium-ion battery (source: <https://goenergylink.com/blog/key-differences-between-lithium-ion-and-lithium-iron-batteries/>)

2.3.2.2. Lead-Acid (PbA)

A lead-acid battery is the oldest battery technology and is also one of the cheapest and most available solutions that find use in automotive and industrial applications as well as power storage systems. PbA batteries are highly recyclable and can operate effectively at both high and low temperatures. Valve-regulated lead-acid (VRLA) batteries are more suitable for power storage solutions than their older counterparts—flooded lead-acid batteries—as they have a longer lifetime, higher capacity, and easier maintenance. Slow charging, heavyweight, and low energy density are among the major drawbacks of this battery technology.

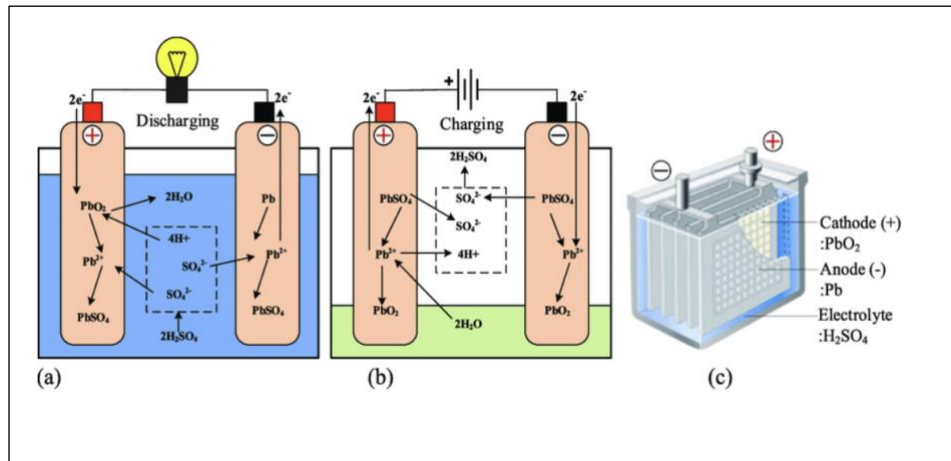


Figure 10: Illustration of a Lead-acid battery (source: <https://panbo.com/a-guide-to-understanding-boat-batteries-part-1-lead-acid/>)

2.3.2.3. Sodium-Sulfur (Na-S)

A sodium-sulfur battery is a cost-effective technology based on molten salt. The advantages of Na-S batteries involve high energy and power density, a long lifetime, and stable operation under extreme ambient conditions. Nevertheless, this battery technology has a limited application area because of high operating temperatures (not less than 300oC) and sensitivity to corrosion. In addition, sodium is a hazardous component that is highly flammable and explosive. Sodium-sulfur batteries are well-suited for standalone energy storage applications integrated with renewable power sources.

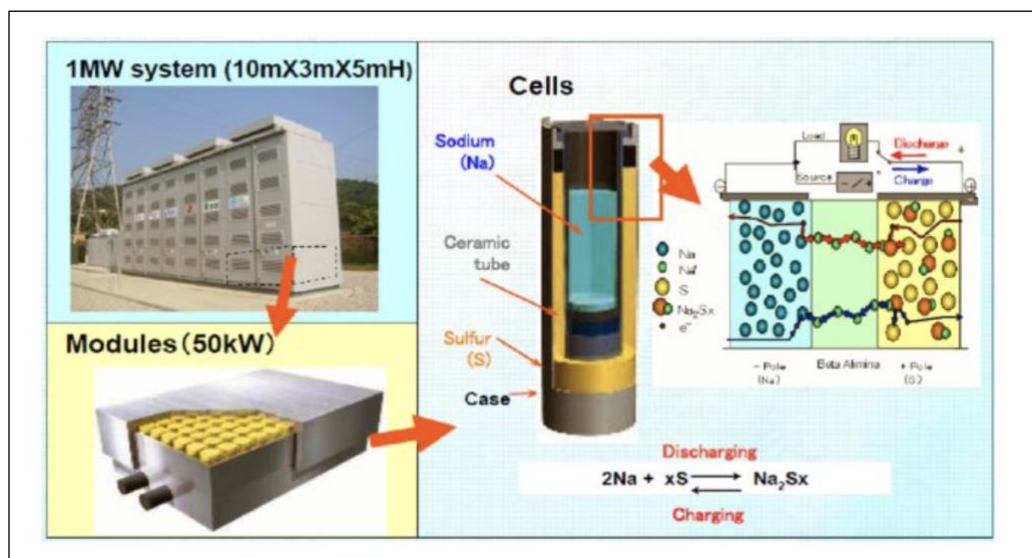


Figure 11: Illustration of a Sodium-Sulfur battery (Source: NGK Insulators Ltd)

2.3.2.4. Flow Batteries

Unlike conventional rechargeable batteries in which energy is stored in solid electrode material, flow batteries store energy in liquid electrolyte solutions. The most common flow battery type is the vanadium redox battery (VRB). The other types consist of zinc-bromine, zinc-iron, and iron-chromium chemistries. Despite their low energy capacity and charge/discharge rate, flow batteries have several important advantages, allowing them to hold a large market share in on-grid and off-grid energy storage systems, including large-scale applications. These benefits involve an extremely long lifespan (up to 30 years), high scalability, fast response time, and a low risk of fires because flow batteries contain non-inflammable electrolytes.

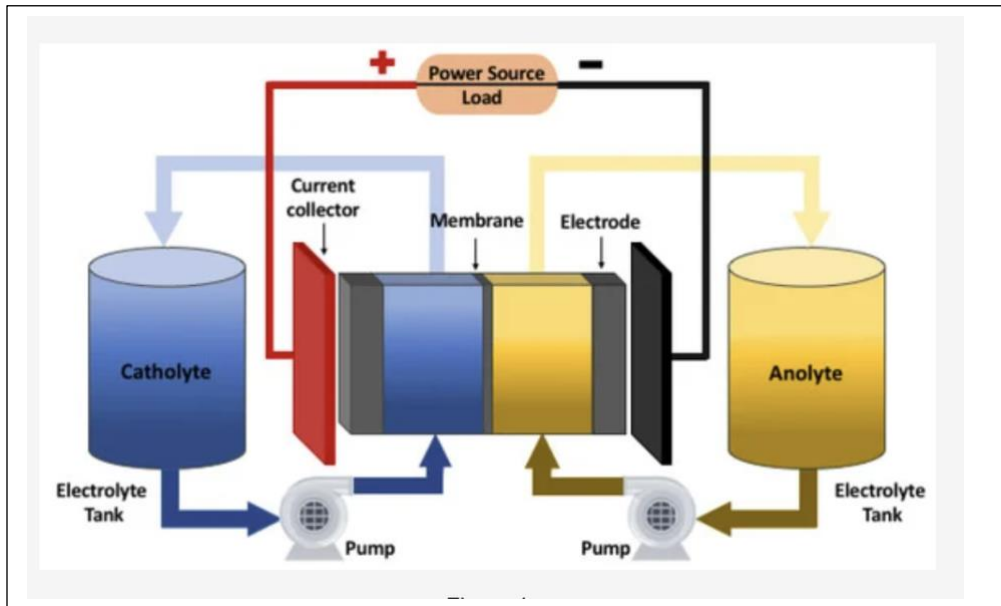


Figure 12: Illustration of a flow-battery (source: *Electronics* 2020, 9, 1567. <https://doi.org/10.3390/electronics9101567>)

2.3.3. Grid connection alternatives

The proposed project is adjacent to the 88kV distribution line and the 275kV transmission line. Both these lines are being assessed as alternatives for connecting the proposed project to the grid.

2.3.4. BESS Usage alternatives

Battery storage can be used in many ways beyond the simple emergency backup in the event of an energy shortage or blackout. Applications differ depending on whether the storage is used for a business or a home.

For **commercial and industrial users**, there are several applications:

- **Peak shaving**, or the ability to manage energy demand to avoid a sudden short-term spike in consumption
- **Load shifting**, allows businesses to shift their energy consumption from one time period to another by tapping the battery when energy costs more
- By giving customers the **flexibility** to reduce their site's grid demand at critical times – without changing their electricity consumption – energy storage makes it a lot easier to participate in a demand response program and save on energy costs
- Batteries are a key component of **microgrids**, which need energy storage to enable them to disconnect from the main electricity grid when needed
- **Renewable integration**, since batteries guarantee a smooth and continuous electricity flow in the absence

2.4. No-go alternative

The No-Go alternative is the option of not establishing the proposed development. South Africa is currently undergoing unprecedented loadshedding and the generated energy from wind and solar are often curtailed when generated during off peaks hours. The proposed development offers Eskom with an opportunity to preserve power that would have been otherwise curtailed and utilised during peak hours. Without the implementation of this project, the use of renewable options for power supply will be compromised in the future as it is unreliable without storage technologies. This has potentially significant negative impacts on environmental and social well-being. Therefore, the No-Go option is not considered as a feasible option on this proposed project.

2.5. Need and desirability

2.5.1. National need and desirability

In the wake of ongoing load-shedding events, the Presidency has drafted an energy action plan under the slogan “*Operation Vulindlela*”. This is a plan toward supporting the implementation of priority structural reforms in achieving energy stability in the country. It is further aimed at driving the economic reform agenda towards economic growth and job creation. The implementation of these actions will be overseen by a National Energy Crisis Committee (NECOM) encompassing all relevant government departments and Eskom, with technical and coordination support from Operation Vulindlela. The energy action plan is focused on five key priorities:

- ☐ Fix Eskom and improve the availability of existing supply ;
- ☐ Enable and accelerate private investment in generation capacity;
- ☐ **Accelerate procurement of new capacity from renewables, gas, and battery storage;**
- ☐ Unleash businesses and households to invest in rooftop solar; and

- ❑ Fundamentally transform the electricity sector to achieve long-term energy security.

South Africa is experiencing an energy crisis due to the high demand of electricity. The proposed battery energy storage system is developed to save electricity and supply it back to the National grid through existing Eskom infrastructure. The "Integrated Resource Plan 2019" outlines the goals for South Africa's transition to green energy by 2030.

By 2030, the plan predicts a 30% decrease in coal's market share and a 25% increase in renewable energy. Due to the change, South Africa requires ground-breaking energy storage methods to guarantee a consistent electricity supply. More BESS development is important in the South African energy sector to lessen the national electricity grid pressure. Whilst there is a need to stabilise the grid with baseload technologies, there is a much-needed power supply during the morning and evening peaks which are currently not being able to be met.

The action plan announced by President Ramaphosa to end load shedding and achieve energy security outlines a range of substantial new-fangled measures to tackle the energy shortage. These actions comprise five priorities to improve Eskom's performance and supplement as much new generation capacity as possible, as quickly as possible.

Priority 3: accelerate procurement of new capacity from renewables, gas and battery storage

- ❑ Projects from the RMIPPPP and Bid Window 5 of the REIPPPP will unlock significant new generation capacity and are ready to proceed once approvals are granted. To achieve this, work is underway between the IPP Office, Eskom, Operation Vulindlela and the DTIC to ensure that these projects reach financial close as quickly as possible, including by providing specific exemptions from local content requirements.
- ❑ The capacity procured through Bid Window 6 will be doubled from the current allocation of 2600 MW to 5200 MW.
- ❑ **Eskom is in the process of procuring 400 MW of battery storage through its Battery Energy Storage Systems (BESS) programme, with the first projects reaching completion within the next twelve months. A further bid window for battery storage will be released in September 2022.**
- ❑ To further accelerate the procurement of additional capacity, a Ministerial determination will be issued for the remaining allocations in the IRP 2019 – this includes 14771 MW of renewable energy and storage.
- ❑ In addition, the IRP 2019 will be reviewed and updated to ensure its continued relevance in line with our energy needs and climate commitments.

2.5.2. Project capability to meet the need and desirability

The South African grid infrastructure needs to adapt to a changing power generation profile to provide the most efficient delivery of electricity supply. Eskom's current base-load coal fleet has exhibited deteriorating efficiency and an inability to meet demand requirements. Renewable energy is currently being introduced into the South African generation mix at an increasing rate to accommodate the country's power generation deficit and contribute to its climate change targets. BESS offers the grid operator a critical tool to improve grid operation efficiencies and address some of its current technical challenges. These include:

- ❑ BESS offers a millisecond response time (much faster than an open cycle gas turbine) to reduce voltage variances, improve the overall quality of supply and maximise flexibility for system management;
- ❑ BESS as a provider of peaking power and ancillary services, significantly reduces the grid operator's foreign exchange exposure related to fuel imports for alternative technologies;
- ❑ The storage solution offered by BESS can serve to unlock constrained networks (and consequently stranded generation);
- ❑ The storage solution offered by BESS can contribute to peak load demand by storing and despatching into the peak demand period; and
- ❑ A BESS can adapt as the energy stack on the grid evolves over time - it is independent of fuel sourcing strategy.

The recognition of the importance of storage in national planning is evidenced by the 2019 IRP, which provides for 2098MW of storage to be introduced onto the grid (along with an annualised quota of 1600MW wind and 1000MW PV) by 2030. BESS will thus play a critical role in supporting the integration of renewable energy and the stability of the transmission and distribution network.

2.6. Socio-economic benefits

The National Development Plan envisaged that, by 2030, South Africa would have an energy sector that provides reliable and efficient energy service at competitive rates; that is **socially equitable** through expanded access to energy at affordable tariffs; that is environmentally sustainable through reduced emissions and pollution. In formulating its vision for the energy sector, the NDP took as a point of departure the Integrated Resource Plan (IRP) 2010–2030 promulgated in March 2011 (as amended). The proposed project is expected to contribute not only to address the reliability and efficiency of the energy sector but also to the socio-economic of the region and the country, as depicted in the table below.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

Description	Details
What is the expected capital value of the activity on completion?	~ ZAR 4 billion
What is the expected yearly income that will be generated by or as a result of the activity?	~ ZAR 550m/yr
Will the activity contribute to service infrastructure?	Yes
Is the activity a public amenity?	No
How many new employment opportunities will be created in the construction phase of the activity?	~30 temporary jobs over 12 months
What is the expected value of the employment opportunities during the construction phase?	~ ZAR 10m
What percentage of this will accrue to previously disadvantaged individuals?	~ ZAR 9m
How many permanent new employment opportunities will be created during the operational phase of the activity?	~ 15 full time jobs
What is the expected current value of the employment opportunities during the first 10 years?	~ZAR 90m (nominal)
What percentage of this will accrue to previously disadvantaged individuals?	~ 90%

CHAPTER 3: APPLICABLE REGULATORY CONTEXT

This section provides insight into the environmental, social and land regulatory framework that governs project development from both the international and local context. Several regulatory framework have been identified and highlighted in the tables below and their applicability to the proposed BESS and associated infrastructure project.

3.1. International regulatory framework

The IFC Performance Standards and Equator Principles (EP) are a “voluntary set of standards for determining, assessing, and managing social and environmental risk in Project financing.” Compliance with these standards is an essential step in meeting the social and environmental requirements of Equator Principles Financial Institutions (EPFI). Guidance on Implementation of the Equator Principles During the COVID-19 Pandemic (June 2020) has been applied throughout the different phases of this due diligence.

Table 5: IFC requirements

PS No. & Para	Performance Standard & Applicable Requirements	Sub-Heading	Requirements	Project's applicability
Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts				
[5]	Environmental and Social Assessment and Management System		The client, in coordination with other responsible government agencies and third parties as appropriate, will conduct a process of environmental and social assessment and establish and maintain an ESMS appropriate to the nature and scale of the project and commensurate with the level of its environmental and social risks and impacts. The ESMS will incorporate the following elements: (i) policy; (ii) identification of risks and impacts; (iii) management programs; (iv) organizational	The Project is currently undergoing an E&S assessment process under the host country's regulatory framework. Prior to the construction phase and based on this E&S assessment process, the Project Company will be required to compile various E&S management plans in line with PS1.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

		capacity and competency; (v) emergency preparedness and response; (vi) stakeholder engagement; and (vii) monitoring and review	
[6]	Policy	The client will establish an overarching policy defining the environmental and social objectives and principles that guide the project to achieve sound environmental and social performance. The policy provides a framework for the environmental and social assessment and management process, and specifies that the project (or business activities, as appropriate) will comply with the applicable laws and regulations of the jurisdictions in which it is being undertaken, including those laws implementing host country obligations under international law.	The ongoing E&S assessment process is being undertaken in accordance with the host country regulatory framework as detailed in the table below and throughout the document.
[7-12]	Identification of Risks and Impacts	The client will establish and maintain a process for identifying the environmental and social risks and impacts of the project. The type, scale, and location of the project guide the scope and level of effort devoted to the risks and impacts identification process. The scope of the risks and impacts identification process will be consistent with good international industry practice and will determine the appropriate and relevant methods and assessment tools.	As part of the ongoing E&S assessment process, the identification of risks and impacts is necessary and appropriate for a project of this nature. Multiple relevant specialist studies have been commissioned to form part of the assessment process.
[13]	Management Programs	Consistent with the client's policy and the objectives and principles described therein, the client will establish management programs that, in sum, will describe mitigation and performance improvement measures and actions that address the identified environmental and social risks and impacts of the project	The assessment report will also entail the drafting of an overarching management programme that details an implementation programme to minimise and/ or eliminate any anticipated negative environmental impacts and enhance positive impacts. The management programme will provide strategies to be utilised to address the roles and responsibilities of environmental management personnel on-site, and a framework for environmental compliance and monitoring.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

[17]	Organizational Capacity and Competency	The client, in collaboration with appropriate and relevant third parties, will establish, maintain, and strengthen as necessary an organizational structure that defines roles, responsibilities, and authority to implement the ESMS. Specific personnel, including management representative(s), with clear lines of responsibility and authority should be designated. Key environmental and social responsibilities should be well defined.	As part of the management programme, key E&S personnel will be identified. This will form part of the overall project's organisation capacity and competency to be finalised prior to construction.
[20]	Emergency Preparedness and Response	Where the project involves specifically identified physical elements, aspects and facilities that are likely to generate impacts, the ESMS will establish and maintain an emergency preparedness and response system so that the client, in collaboration with appropriate and relevant third parties, will be prepared to respond to accidental and emergency situations associated with the project in a manner appropriate to prevent and mitigate any harm to people and/or the environment. This preparation will include the identification of areas where accidents and emergency situations may occur, communities and individuals that may be impacted, response procedures, provision of equipment and resources, designation of responsibilities, communication, including that with potentially Affected Communities and periodic training to ensure effective response. The emergency preparedness and response activities will be periodically reviewed and revised, as necessary, to reflect changing conditions.	Prior to the construction phase and based on this E&S assessment process, the Project Company will be required to compile various E&S management plans in line with PS1.
[22]	Monitoring and Review	The client will establish procedures to monitor and measure the effectiveness of the management program, as well as compliance with any related legal and/or contractual obligations and regulatory requirements.	The management programme will provide strategies to be utilised to address the roles and responsibilities of environmental management personnel on-site, and a framework for environmental compliance monitoring and review.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

[25]	Stakeholder Engagement	<p>The client will develop and implement a Stakeholder Engagement Plan that is scaled to the project risks and impacts and development stage, and be tailored to the characteristics and interests of the Affected Communities. Where applicable, the Stakeholder Engagement Plan will include differentiated measures to allow the effective participation of those identified as disadvantaged or vulnerable. Disclosure of relevant project information helps Affected Communities and other stakeholders understand the risks, impacts and opportunities of the project. The client will provide Affected Communities with access to relevant information²⁶ on:</p> <ul style="list-style-type: none"> (i) the purpose, nature, and scale of the project; (ii) the duration of proposed project activities; (iii) any risks to and potential impacts on such communities and relevant mitigation measures; (iv) the envisaged stakeholder engagement process; and (v) the grievance mechanism. <p>For projects with adverse impacts to Indigenous Peoples, the client is required to engage them in a process of ICP and in certain circumstances the client is required to obtain their Free, Prior, and Informed Consent (FPIC).</p>	<p>The E&S regulatory framework within the host country requires that project of this nature undertake a stakeholder engagement process as part of the E&S assessment process. The stakeholder engagement process entails the identification and participation of Interested and Affected Parties (I&APs). These IAPs form part of the project database and are kept informed about the project including the opportunity to comment on the project documents up until the project receives an environmental authorisation.</p>
[34-35]	External Communications and Grievance Mechanisms	<p>Clients will implement and maintain a procedure for external communications that includes methods to</p> <ul style="list-style-type: none"> (i) receive and register external communications from the public; (ii) screen and assess the issues raised and determine how to address them; (iii) provide, track, and document responses, if any; and 	<p>Prior to the construction phase and based on this E&S assessment process, the Project Company will be required to compile various E&S management plans in line with PS1.</p> <p>The Project Company to develop a Grievance mechanism. This mechanism is of utmost importance given the concerns which will be expressed by I&APs parties during the stakeholder engagement process. The mechanism should</p>

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

		<p>(iv) adjust the management program, as appropriate. In addition, clients are encouraged to make publicly available periodic reports on their environmental and social sustainability.</p> <p>Where there are Affected Communities, the client will establish a grievance mechanism to receive and facilitate resolution of Affected Communities' concerns and grievances about the client's environmental and social performance. The grievance mechanism should be scaled to the risks and adverse impacts of the project and have Affected Communities as its primary user.</p>	specify the procedure for filing complaints, processing them, providing a response and what to do if the response is rejected.
Performance Standard 2: Labor and Working Conditions			
[8-20]	Working Conditions and Management of Worker Relationship	<p>The client will adopt and implement human resources policies and procedures appropriate to its size and workforce that set out its approach to managing workers consistent with the requirements of this Performance Standard and national law.</p> <p>Where the client is a party to a collective bargaining agreement with a workers' organization, such agreement will be respected. Where such agreements do not exist, or do not address working conditions and terms of employment, the client will provide reasonable working conditions and terms of employment.</p> <p>Where accommodation services are provided to workers covered by the scope of this Performance Standard, the client will put in place and implement policies on the quality and management of the accommodation and provision of basic services. The accommodation services will be provided in a manner consistent with the principles of non-discrimination and equal opportunity. Workers'</p>	Prior to construction, the project will be required to fully comply with the PS2 with respect to the various labour plans.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

		<p>accommodation arrangements should not restrict workers' freedom of movement or of association.</p> <p>In countries where national law recognizes workers' rights to form and to join workers' organizations of their choosing without interference and to bargain collectively, the client will comply with national law. Where national law substantially restricts workers' organizations, the client will not restrict workers from developing alternative mechanisms to express their grievances and protect their rights regarding working conditions and terms of employment. The client should not seek to influence or control these mechanisms.</p> <p>The client will not make employment decisions based on personal characteristics unrelated to inherent job requirements. The client will base the employment relationship on the principle of equal opportunity and fair treatment and will not discriminate with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, termination of employment or retirement, and disciplinary practices.</p> <p>Prior to implementing any collective dismissals, the client will carry out an analysis of alternatives to retrenchment.</p> <p>If the analysis does not identify viable alternatives to retrenchment, a retrenchment plan will be developed and implemented to reduce the adverse impacts of retrenchment on workers. The retrenchment plan will be based on the principle of non-discrimination and will reflect the client's consultation with workers, their organizations, and, where appropriate, the government, and comply with</p>	
--	--	---	--

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

		<p>collective bargaining agreements if they exist. The client will comply with all legal and contractual requirements related to notification of public authorities, and provision of information to, and consultation with workers and their organizations.</p> <p>The client should ensure that all workers receive notice of dismissal and severance payments mandated by law and collective agreements in a timely manner.</p> <p>All outstanding back pay and social security benefits and pension contributions and benefits will be paid</p> <ul style="list-style-type: none"> i) on or before termination of the working relationship to the workers, ii) where appropriate, for the benefit of the workers, or iii) payment will be made in accordance with a timeline agreed through a collective agreement. <p>Where payments are made for the benefit of workers, workers will be provided with evidence of such payments.</p> <p>The client will provide a grievance mechanism for workers (and their organizations, where they exist) to raise workplace concerns. The client will inform the workers of the grievance mechanism at the time of recruitment and make it easily accessible to them. The mechanism should involve an appropriate level of management and address concerns promptly, using an understandable and transparent process that provides timely feedback to those concerned, without any retribution.</p>	
[21-22]	Protecting the Work Force	The client will not employ children in any manner that is economically exploitative or is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development. The client will identify the presence of all	Prior to construction, the project will be required to fully comply with the PS2 with respect to the various labour plans

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

		<p>persons under the age of. Where national laws have provisions for the employment of minors, the client will follow those laws applicable to the client. Children under the age of 18 will not be employed in hazardous work.</p> <p>The client will not employ forced labor, which consists of any work or service not voluntarily performed that is exacted from an individual under threat of force or penalty.</p>	
[23]	Occupational Health and Safety	<p>The client will provide a safe and healthy work environment, taking into account inherent risks in its particular sector and specific classes of hazards in the client's work areas, including physical, chemical, biological, and radiological hazards, and specific threats to women. The client will take steps to prevent accidents, injury, and disease arising from, associated with, or occurring in the course of work by minimizing, as far as reasonably practicable, the causes of hazards. In a manner consistent with good international industry practice, as reflected in various internationally recognized sources including the World Bank Group Environmental, Health and Safety Guidelines, the client will address areas that include the</p> <ul style="list-style-type: none"> i) identification of potential hazards to workers, particularly those that may be life-threatening; ii) provision of preventive and protective measures, including modification, substitution, or elimination of hazardous conditions or substances; iii) training of workers; iv) documentation and reporting of occupational accidents, diseases, and incidents; and v) emergency prevention, preparedness, and response arrangements. 	The Contractor on behalf of the Project Company to develop a HSSE plan highlighting key regulatory framework including OHS Act.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

[24-26]	Workers Engaged by Third Parties	<p>With respect to contracted workers the client will take commercially reasonable efforts to ascertain that the third parties who engage these workers are reputable and legitimate enterprises and have an appropriate ESMS that will allow them to operate in a manner consistent with the requirements of this Performance Standard, except for paragraphs 18–19, and 27–29</p> <p>The client will establish policies and procedures for managing and monitoring the performance of such third-party employers in relation to the requirements of this Performance Standard. In addition, the client will use commercially reasonable efforts to incorporate these requirements in contractual agreements with such third-party employers.</p> <p>The client will ensure that contracted workers, covered in paragraphs 24–25 of this Performance Standard, have access to a grievance mechanism.</p>	Prior to construction, the project will be required to fully comply with the PS2 with respect to the various labour plans.
[27]	Supply Chain	Where there is a high risk of child labor or forced labor in the primary supply chain, the client will identify those risks consistent with paragraphs 21 and 22 above. If child labor or forced labor cases are identified, the client will take appropriate steps to remedy them. The client will monitor its primary supply chain on an ongoing basis to identify any significant changes in its supply chain and if new risks or incidents of child and/or forced labor are identified, the client will take appropriate steps to remedy them.	Prior to construction, the project will be required to fully comply with the PS2 with respect to the various labour plans
Performance Standard 3: Resource Efficiency and Pollution Prevention			
[10-17]	Pollution Prevention	The client will avoid the release of pollutants or, when avoidance is not feasible, minimize and/or control the intensity and mass flow of their release. This applies to the release of pollutants to air, water, and land due to routine,	As part of the ongoing E&S assessment process, the identification of risks and impacts is necessary and appropriate for a project of this nature.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

		<p>non-routine, and accidental circumstances with the potential for local, regional, and transboundary impacts.</p> <p>The client will avoid the generation of hazardous and non-hazardous waste materials. Where waste generation cannot be avoided, the client will reduce the generation of waste, and recover and reuse waste in a manner that is safe for human health and the environment. Where waste cannot be recovered or reused, the client will treat, destroy, or dispose of it in an environmentally sound manner that includes the appropriate control of emissions and residues resulting from the handling and processing of the waste material.</p> <p>The client will avoid or, when avoidance is not possible, minimize and control the release of hazardous materials. In this context, the production, transportation, handling, storage, and use of hazardous materials for project activities should be assessed.</p> <p>The client will, where appropriate, formulate and implement an integrated pest management (IPM) and/or integrated vector management (IVM) approach targeting economically significant pest infestations and disease vectors of public health significance. The client's IPM and IVM program will integrate coordinated use of pest and environmental information along with available pest control methods, including cultural practices, biological, genetic, and, as a last resort, chemical means to prevent economically significant pest damage and/or disease transmission to humans and animals.</p>	<p>The Project Company to develop a Pollution Prevention plan highlighting sources of pollution, management, and disposal including key pollution sources highlighted in the management programme such as dust and noise.</p> <p>Further management plans will require to be draft prior to the construction phase.</p>
Performance Standard 4: Community Health, Safety, and Security			
[5-9]	Community Health and Safety	The client will evaluate the risks and impacts to the health and safety of the Affected Communities during the project lifecycle and will establish preventive and control	During the assessment process, specialist studies such as Major Hazard Installation (MHI) were

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

		<p>measures consistent with good international industry practice (GIIP), such as in the World Bank Group Environmental, Health and Safety Guidelines (EHS Guidelines) or other internationally recognized sources.</p> <p>The client will avoid or minimize the potential for community exposure to waterborne, water based, water-related, and vector borne diseases, and communicable diseases that could result from project activities, taking into consideration differentiated exposure to and higher sensitivity of vulnerable groups. Where specific diseases are endemic in communities in the project area of influence, the client is encouraged to explore opportunities during the project lifecycle to improve environmental conditions that could help minimize their incidence</p>	<p>commissioned to identify any potential risk or impacts of the project relative to the adjacent residential areas. Based on identified risks and impacts within this study, the Project Company will be required to -prior construction phase -develop a Community H&S management plan.</p>
[12-14]	Security Personnel	<p>When the client retains direct or contracted workers to provide security to safeguard its personnel and property, it will assess risks posed by its security arrangements to those within and outside the project site.</p> <p>The client will consider and, where appropriate, investigate all allegations of unlawful or abusive acts of security personnel, take action (or urge appropriate parties to take action) to prevent recurrence, and report unlawful and abusive acts to public authorities</p>	<p>Prior to the construction phase, the Main Contractor on behalf of the Project Company is required to draft a Security Management Plan which should entail risk and impact identification process, including community engagement and disclosure, awareness training around gender-specific culture, appropriate behaviour of security personnel, instructions on when and how force may be used, firearms protocols (if applicable), human rights requirements, and investigation and reporting of security incidents in alignment with the Voluntary Principles of Security and Human Rights. The security guards must be performed a background check and they shall commit with a relevant Code of Conduct.</p>
Performance Standard 5: Land Acquisition and Involuntary Resettlement			
Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources			

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

[9-23]	Protection and Conservation of Biodiversity	<p>The client will not significantly convert or degrade natural habitats, unless all of the following are demonstrated:</p> <ul style="list-style-type: none"> • No other viable alternatives within the region exist for development of the project on modified habitat; • Consultation has established the views of stakeholders, including Affected Communities, with respect to the extent of conversion and degradation; and • Any conversion or degradation is mitigated according to the mitigation hierarchy. <p>In areas of natural habitat, mitigation measures will be designed to achieve no net loss of biodiversity where feasible.</p> <p>Appropriate actions include:</p> <ul style="list-style-type: none"> • Avoiding impacts on biodiversity through the identification and protection of set asides; • Implementing measures to minimize • habitat fragmentation, such as biological corridors; • Restoring habitats during operations and/or after operations; and • Implementing biodiversity offsets. <p>The client will not intentionally introduce any new alien species (not currently established in the country or region of the project) unless this is carried out in accordance with the existing regulatory framework for such introduction. Notwithstanding the above, the client will not deliberately introduce any alien species with a high risk of invasive behavior regardless of whether such introductions are permitted under the existing regulatory framework.</p>	<p>The E&S screening process identified the Project site as a high biodiversity sensitivity area. As such a biodiversity specialist was appointed to assess the project site to ascertain the status. Furthermore, identify aspect of the project which could potentially impact sensitive areas and recommend relevant and appropriate mitigations measures to reduce the impacts.</p>
Performance Standard 7: Indigenous Peoples (N/A)			

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

Performance Standard 8: Cultural Heritage

[6-7]	Protection of Cultural Heritage in	The client is responsible for siting and designing a project to avoid significant adverse impacts to cultural heritage. The environmental and social risks and impacts identification process should determine whether the proposed location of a project is in areas where cultural heritage is expected to be found, either during construction or operations. In such cases, as part of the client's ESMS, the client will develop provisions for managing chance finds ¹ through a chance find procedure which will be applied if cultural heritage is subsequently discovered. The client will not disturb any chance find further until an assessment by competent professionals is made and actions consistent with the requirements of this Performance Standard are identified	The screening tool reported that the Project site is in an area of low potential to cultural heritage. This was confirmed by a specialist study commissioned to assess both the heritage and the palaeontological status of the site. As such, the Main Contractor on behalf of the Project Company will be required to develop a chance and find plan in addressing any cultural heritage that might be excavated during the construction phase.
--------------	------------------------------------	--	---

3.2. Equator Principles

The Equator Principles (EPs) is a risk management framework adopted by financial institutions for determining, assessing, and managing environmental and social risk within projects and is primarily intended to provide a minimum standard for due diligence and monitoring to support responsible risk decision-making. Project finance is often used to fund the development and construction of major infrastructure and industrial projects.

The EPs primarily aim to provide a minimum standard for due diligence to support responsible risk decision-making. The EPs are based on the IFC PS 2012 and the World Bank Group Environmental, Health and Safety Guidelines (EHS Guidelines). The Equator Principles Financial Institutions (EPFIs) have consequently adopted these Principles to ensure that the projects they finance are developed in a manner that is socially responsible and reflects sound environmental management practices. EPFIs will only provide loans to projects that conform to the following principles:

- Principle 1: Review and Categorisation.
- Principle 2: Social and Environmental Assessment.
- Principle 3: Applicable Social and Environmental Standards.
- Principle 4: Action plan and Management.
- Principle 5: Consultation and Disclosure.
- Principle 6: Grievance Mechanism.
- Principle 7: Independent review.
- Principle 8: Covenants.
- Principle 9: Independent Monitoring and Reporting.
- Principle 10: EPFI Reporting.

This section describes the Project's compliance with the Equator Principles (EP4) with references to Section 3.1, which describes the compliance of Project E&S assessment with the IFC Performance Standards to avoid duplication. This Review covers Principles 1 through 10 and is based on EP4 dated July 2020.

3.2.1. Principle 1: Review and Categorization

In line with the BA report, the Project is categorised as a **Category B** with potential limited adverse environmental or social risks and/ or impacts that are minor to moderate, generally site-specific, largely reversible, and readily addressed through mitigation measures.

3.2.2. Principle 3: Applicable Social and Environmental Standards

Requirement: The EP state that *“The Assessment process should, in the first instance, address compliance with relevant host country laws, regulations and permits that pertain to environmental and social issues”*. In addition, *“for projects located in Non-Designated Countries, compliance with the applicable IFC Performance Standards on Environmental and Social Sustainability (Performance Standards) and the World Bank Group Environmental, Health and Safety Guidelines (EHS Guidelines)”* is required. South Africa is a non-designated country, and the IFC Performance Standards (PS) and World Bank Group EHS Guidelines also apply to the project. The alignment with the IFC PS is reviewed in Section 3.1 above.

ACTION PLAN

Requirement: Where the applicable standards are not met to the EPFI’s satisfaction, the Project Company and the EPFI will agree to an Equator Principles Action Plan (EPAP). If the Project does not meet standards, Financing Institutions could require the Project Company to commit to an Equator Principles Action Plan (EPAP).

3.2.3. Principle 9: Independent Monitoring and Reporting

Requirement: *For all Category A and, as appropriate, Category B Projects, to assess Project compliance with the Equator Principles after Financial Close and over the life of the loan, the EPFI will require independent monitoring and reporting.* The ECO will carry out daily site monitoring against various project documents and approvals and will compile a monthly E&S monitoring report throughout the construction and rehabilitation phases.

3.2.4. Principle 10: Reporting and Transparency

Requirement: *The Project Company will ensure that, at a minimum, a summary of the ESIA is accessible and available online and includes a summary of Human Rights impacts.* The Project Company should publish the project documents, including the BA and other complementary environmental and social records, on their website.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

3.1. Host country's regulatory framework

Item no.	Relevant Regulatory Framework	Applicability to the project
1.	<ul style="list-style-type: none"> <input type="checkbox"/> The National Environmental Management Act 107 of 1998 ("NEMA") is the principal environmental statute which regulates environmental management and seeks to give effect to the environmental right enshrined in section 24 of the Constitution. <input type="checkbox"/> NEMA provides that an environmental authorisation ("EA") is required by any person that intends to undertake certain listed activities that are considered likely to have a detrimental impact on the environment and have been identified in Listing Notice 1 (GN R983, GG 38282 of 4 December 2014), Listing Notice 2 (GN R984, GG 38282 of 4 December 2014), or Listing Notice 3 (GN R985, GG 38282 of 4 December 2014) published under the Environmental Impact Assessment ("EIA") Regulations (GN R982, GG 38282 of 4 December 2014). <input type="checkbox"/> If a listed activity under Listing Notice 1 or Listing Notice 3 is triggered, a basic assessment process must be followed in order to obtain an EA. If, on the other hand, a listed activity under Listing Notice 2 is triggered, the more comprehensive scoping and environmental impact reporting process must be followed. The reports prepared during these processes, together with the associated specialist studies, must be subject to a prescribed public participation process. 	<p>The Project is currently undergoing a Basic Assessment process as detailed in Part 2 of Chapter 4 of the EIA regulations (as amended) to comply with NEMA.</p>
2.	<ul style="list-style-type: none"> <input type="checkbox"/> Any person who intends to undertake a water use (as contemplated in the NWA) must ensure that the water use is conducted in accordance with a WUL or otherwise be authorised in terms of the NWA. <input type="checkbox"/> A WUL is required if any of the following water uses under section 21 of the NWA are triggered: <ul style="list-style-type: none"> o taking water from a water resource [section 21(a)]; o storing water [section 21(b)]; o impeding or diverting the flow of water in a watercourse [section 21(c)]; o engaging in a stream flow reduction activity contemplated in section 36 of the NWA [section 21(d)]; o engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1) of the NWA [section 21(e)]; 	<p>There are no identified and known watercourse within the project site as such no trigger to the Section 21 of the NWA.</p> <p>Project water needs will be trucked to site and stored in JoJo tanks.</p>

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

	<ul style="list-style-type: none"> ○ discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit [section 21(f)]; ○ disposing of waste in a manner which may detrimentally impact on a water resource [section 21(g)]; ○ disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process [section 21(h)]; ○ altering the bed, banks, course or characteristics of a watercourse [section 21(i)]; ○ removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people [section 21(j)]; and ○ using water for recreational purposes [section 21(k)]. <p><input type="checkbox"/> A person may only use water without a licence if the water use is permissible under Schedule 1 of the NWA (which includes reasonable domestic and small-scale uses), if the water use is permissible as a continuation of an existing lawful use (any water use which was lawful under the Water Act 54 of 1956 and which took place within two years prior to 1 October 1998) or if the water use is permissible in terms of a General Authorisation issued under section 39 of the NWA.</p>	
3.	<p><input type="checkbox"/> The National Environmental Management: Protected Areas Act 57 of 2003 ("NEMPAA") regulates protected areas and provides for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity.</p> <p><input type="checkbox"/> NEMPAA restricts or prohibits activities that are likely to have an adverse effect on the environment in a declared protected area. It is, however, possible to undertake certain restricted/prohibited activities in a protected area once a permit for such activity has been issued.</p> <p><input type="checkbox"/> Section 50(5) of NEMPAA provides that no development or construction may be permitted in a national park, nature reserve or world heritage site without the prior written approval of the management authority.</p> <p><input type="checkbox"/> It is also important to note that Listing Notice 3 published under the EIA Regulations includes various listed activities relating to the proximity of certain developments from protected areas contemplated in section 9 of NEMPAA (including the core areas of biosphere reserves and their buffers), National Protected Area Expansion Strategy Focus areas, World Heritage Sites and critical biodiversity areas, amongst others. If any of these listed activities are triggered, the Project will require an EA.</p>	The site falls within the Crocodile River Reserve, consent has been obtained from relevant authorities for the development of the propose project in line with the Act.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

4.	<ul style="list-style-type: none"> <input type="checkbox"/> The National Environmental Management: Biodiversity Act 10 of 2004 (“NEMBA”) provides a framework for the conservation of biodiversity and the protection of species and ecosystems that warrant protection. <input type="checkbox"/> In achieving this objective, NEMBA requires that a permit be obtained if any person intends to: <input type="checkbox"/> carry out a restricted activity involving a specimen of a listed threatened or protected species; and <input type="checkbox"/> carry out a restricted activity in relation to a specimen of an alien species or listed invasive species. <input type="checkbox"/> A “restricted activity” is defined very broadly in NEMBA and almost any action in respect of a listed threatened or protected species or in respect of an alien species or listed invasive species would require a permit prior to undertaking that activity. <input type="checkbox"/> Restricted activities in relation to a specimen of a listed threatened or protected species include: <ul style="list-style-type: none"> ○ hunting, catching, capturing or killing any living specimen of a listed threatened or protected species by any means; ○ gathering, collecting or plucking any specimen of a listed threatened or protected species; ○ picking parts of, or cutting, chopping off, uprooting, damaging or destroying, any specimen of a listed threatened or protected species; and ○ conveying, moving or otherwise translocating any specimen of a listed threatened or protected species etc. ○ Restricted activities in relation to a specimen of an alien species or listed invasive species include: ○ having in possession or exercising physical control over any specimen of an alien or listed invasive species; ○ growing, breeding or in any other way propagating any specimen of an alien or listed invasive species, or causing it to multiply; and ○ conveying, moving or otherwise translocating any specimen of an alien or listed invasive species etc. <input type="checkbox"/> Should a development trigger any activity in relation to any of the listed species, a permit must be obtained. 	<p>According to the Environmental screening tool, the site comprises of high biodiversity areas and as such a biodiversity specialist assessment was commissioned to verify the site’s sensitivity status. The outcome of the assessment confirmed the presence of several stands of <i>Melolobium subspicatum</i> in the immediate surrounds of the proposed development layout. Alternative as such the project layout was relocated south of the property to which the sensitivity is low and sensitive species falls outside of the development buffer zone. There are no permits required however a walkthrough survey will be required prior to construction.</p>
----	---	---

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

	<input type="checkbox"/> Further permitting requirements may also be imposed by provincial biodiversity legislation such as the Northern Cape Nature Conservation Act 9 of 2009 ("NCNCA").	
5.	<input type="checkbox"/> The National Forests Act 84 of 1998 ("NFA") regulates the protection of certain forests and trees. The NFA provides that a licence or exemption must be obtained in order to: <ul style="list-style-type: none"> ○ cut, disturb, damage or destroy (i) any indigenous tree in a natural forest; or (ii) any protected tree; or ○ possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any tree, or any forest product derived from (i) an indigenous tree in a natural forest; or (ii) a protected tree. <input type="checkbox"/> The List of Protected Tree Species (GN 155, GG 44204 of 1 March 2021) provides a list of all protected trees in terms of the NFA.	<p>According to the Environmental screening tool, the site comprise of high biodiversity areas and as such a biodiversity specialist was commissioned to assess the site. The outcome of the assessment confirmed that there are no protected trees occurring within the project site.</p>
6.	<input type="checkbox"/> Section 38 of the National Heritage Resources Act 25 of 1999 ("NHRA") states, inter alia, that any person that intends to construct a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length or undertake a development exceeding 5000m ² in extent is required to notify the relevant heritage resources authority and furnish it with details regarding the proposed development. The heritage resources authority may require that a heritage impact assessment ("HIA") be conducted and a report submitted to the relevant authority for approval. <input type="checkbox"/> Where the HIA forms part of an EIA process, a separate HIA in accordance with section 38 is not required, provided that the consenting authority ensures that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of the NHRA and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent. In these instances, a discrete approval or consent from the relevant heritage resources authority is therefore not required in terms of section 38 of the NHRA. <input type="checkbox"/> The NHRA also provides that permits are required from the South African Heritage Resources Agency ("SAHRA") and/or a provincial heritage resources authority, as may be applicable, for certain activities which may impact heritage resources. Such activities include: <input type="checkbox"/> demolishing or altering any structure or part of a structure older than 60 years (section 34(1));	<p>According to the heritage and palaeontological assessment reports, the project site no known sites are located within the impact area therefore no adverse impact to heritage resources is expected.</p>

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

	<ul style="list-style-type: none"> <input type="checkbox"/> destroying, damaging, excavating, altering, defacing or otherwise disturbing any archaeological or palaeontological site, material or object or any meteorite (section 35(4)); and <input type="checkbox"/> destroying, damaging, altering, exhuming or removing from its original position or otherwise disturbing any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority, the grave of a victim of conflict, or any burial ground or part thereof which contains such graves (section 36(3)). 	
7.	<ul style="list-style-type: none"> <input type="checkbox"/> The Civil Aviation Act 13 of 2009 regulates aviation in South Africa. <input type="checkbox"/> According to Part 139.01.30 of the Civil Aviation Regulations (GN R425, GG 35398 of 1 June 2012) any structure or building, whether temporary or permanent, which has the potential to endanger aviation in navigable airspace, or has the potential to interfere with the operation of navigation or surveillance systems or instrument landing systems, including meteorological systems for aeronautical purposes, is considered an obstacle and must be submitted to the South African Civil Aviation Authority (“SACAA”) for evaluation and approval. 	The Project site is located within proximity to the Lanseria Airport. A CAA application will be submitted to the civil aviation authority.
8.	<ul style="list-style-type: none"> <input type="checkbox"/> Section 53(1) of the Mineral and Petroleum Resources Development Act 28 of 2002 (“MPRDA”) provides that, subject to the exclusions set out on section 53(2) of the MPRDA, the use of the surface of any land in any way which may be contrary to any object of the MPRDA or which is likely to impede any such object requires the approval of the Minister of Mineral Resources and Energy, pursuant to an application in the prescribed manner. 	An application in respect of Section 53 for the Project will be submitted to DMR.
9.	<ul style="list-style-type: none"> <input type="checkbox"/> The Astronomy Geographic Advantage Act 21 of 2007 (“AGAA”) seeks to preserve and protect areas that are uniquely suited for optical and radio astronomy. <input type="checkbox"/> Section 25(3) of the AGAA provides that any person who intends to undertake an “identified activity” must, prior to commencing such activity, notify the relevant competent authority and provide details regarding the location, nature and extent of the proposed activity. <input type="checkbox"/> An “identified activity” under the AGAA means an activity declared by the Minister responsible for science and technology which, if undertaken in a coordinated astronomy advantage area, may have a detrimental effect on astronomy and related scientific endeavours within any astronomy advantage area. An astronomy advantage area is defined in the AGAA as a core, central or co-ordinated astronomy advantage area. 	During the BA process, the AGAA authority will be provided with the Project information to issue consent letter in support of the Project.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

	<ul style="list-style-type: none"> ❑ The competent authority must, within 60 days of receipt of a notification, either: (i) notify the person who intends to undertake the identified activity to submit an impact assessment report; or (ii) issue an exemption, which may be subject to conditions. ❑ Section 25(7) further provides that if the competent authority fails to act within the 60 day period, the person who made the notification must resubmit the notification. If the competent authority once again fails to respond to the notification, it is regarded as having issued an exemption. 	
10.	<ul style="list-style-type: none"> ❑ The Electronic Communication Act 36 of 2005 (“ECA”) requires that any person who constructs works for the supply of light, heat or power by means of electricity, must notify electronic communications network service licensees of the proposed works; provide such licensees with a plan of the proposed works and any further information that may be required; and comply with any requirements imposed by such licensees. ❑ Section 29(1)(b) of the ECA provides that electronic communications network service licensees must be notified at least 30 days prior to commencement of construction. 	During the BA process, ECA registered organisations will be provided with the Project information to issue comments in respect the project.
11.	<ul style="list-style-type: none"> ❑ The National Environmental Management: Waste Act 59 of 2008 (“NEMWA”) regulates the management of waste and the control of waste management activities. ❑ The NEMWA provides that no person may commence, undertake or conduct a waste management activity listed under the List of Waste Management Activities (GN 921, GG 37083 of 29 November 2013) without a waste management licence (“WML”) or complying with prescribed requirements or standards. ❑ Waste management activities that fall under Categories A or B of the List of Waste Management Activities require a WML. A basic assessment process must be conducted in respect of Category A waste management activities; whereas Category B waste management activities require a scoping assessment and EIA. Waste management activities that fall under Category C do not require a WML but must comply with the relevant norms and standards. 	The Project will generate general and hazardous waste which will be discarded at licensed facilities, and which do not trigger the need for a waste license.
12.	<ul style="list-style-type: none"> ❑ The Hazardous Substances Act 15 of 1973 (“HSA”) provides for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances and provides for the division of such substances or products into groups in relation to the degree of danger. 	The Project will not utilise hazardous substance requiring or triggering the need of a license.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

	<ul style="list-style-type: none"> <input type="checkbox"/> A licence is required in order to sell any Group I hazardous substance; sell, let, use, operate, apply or install any Group III hazardous substance; or produce, acquire, dispose, import, export, possess, use or convey any Group IV hazardous substance. <input type="checkbox"/> Group I hazardous substances (GN R452, GG 5467 of 25 March 1977) include substances such as arsenic, cyanides, lead acetate, thallium and zinc phosphide. <input type="checkbox"/> Group III hazardous substances (GN R1302, GG 13299 of 14 June 1991) include electronic products generating X-rays or other ionizing beams, electromagnetic radiation in the ultraviolet region, or radiation produced by stimulated emission, or radiation in the infrared region. <input type="checkbox"/> Group IV hazardous substances are defined in the HSA as “radioactive material which is outside a nuclear installation as defined in the Nuclear Energy Act, 1999, and is not a material which forms part of or is used or intended to be used in the nuclear fuel cycle”. <input type="checkbox"/> The Minister of Health has declared all substances and goods specified in the South African Bureau of Standards' latest Code of Practice 0228: <i>The Identification and Classification of Dangerous Substances and Goods</i> as Group II hazardous substances, with the exception of Class 1: Explosives and Class 7: Radioactive Substances. No licensing requirements are applicable in respect of Group II hazardous substances. 	
13.	<ul style="list-style-type: none"> <input type="checkbox"/> According to section 21 of the National Environmental Management: Air Quality Act 39 of 2004 ("NEMAQA"), any person who intends to undertake an activity which results in atmospheric emissions and which has been identified to have or likely to have a significant detrimental effect on the environment (including health, social conditions, economic conditions, ecological conditions or cultural heritage), must obtain an Atmospheric Emission Licence ("AEL") prior to undertaking such listed activity. <input type="checkbox"/> The various activities that require an AEL are found in the Listed Activities (GN 893, GG 37054 of 22 November 2013) published under NEMAQA. 	The Project and associated infrastructure will not release emissions regulated under NEMAQA and as such will not require an air emissions license.
14.	<ul style="list-style-type: none"> <input type="checkbox"/> CARA provides for the regulation of control over the utilisation of the natural agricultural resources in order to promote the conservation of soil, water and vegetation and provides for the combating of weeds and invader plant species. <input type="checkbox"/> The CARA Regulations (GN R1048, GG 9238 of 25 May 1984) provide that a person must apply for permission for the cultivation of virgin soil (to ensure that only arable land is being cultivated); for 	The Project site does not fall within the ambit of the CARA regulation and as such this consent is not required.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

	<p>veld burning; and for the keeping of invader plants in a demarcated area or a biological control reserve.</p> <ul style="list-style-type: none"> ❑ Regulation 7(1) of the CARA Regulations also provides that no land user may utilise the vegetation in a vlei, marsh or water sponge or within the flood area of a water course or within 10m horizontally outside such flood area in a manner that causes or may cause the deterioration of or damage to the natural agricultural resources. ❑ Regulation 7(3) provides that, except on authority of a written permission by the executive officer, no land user shall: (i) drain or cultivate any vlei, marsh or water sponge or a portion thereof on his/her farm unit; or (ii) cultivate any land on his farm unit within the flood area of a water course or within 10m horizontally outside the flood area of a water course. ❑ In addition, no land user shall in any manner whatsoever divert any run-off water from a water course on his/her farm unit to any other water course, except on authority of a written permission by the executive officer (Regulation 8(1)). ❑ The CARA Regulations also regulate the control of plants that are regarded as weeds or invader plants (listed in Table 3 of the Regulations). Should any weeds or invader plants be found on the site, the Bidder will be required to ensure that it complies with the requirements of CARA. 	
15.	<ul style="list-style-type: none"> ❑ The Electricity Regulation Act, (Act 4 Of 2006), 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 framework. The Act lessor provides for licenses and registration as the manner in which generation, transmission, distribution, trading and the importer and export of electricity are regulated. 	In line with the ERA, the project will require a consent from both NERSA and ESKOM in. order to be connected to the national grid.

CHAPTER 4: APPROACH TO THE BASIC ASSESSMENT PROCESS

4.1. Overview of the Basic Assessment process

According to Chapter 4 Part 3 of the 2014 EIA regulations (as amended), any project triggering listed activities within Listing Notice 2 is required to undergo a full scoping and EIA process. However, the proposed project is located within the Central Transmission Corridor (refer to the figure below) as identified in terms of Section 24(2)(a) of the National Environmental Management Act (Ac 107 of 1998).

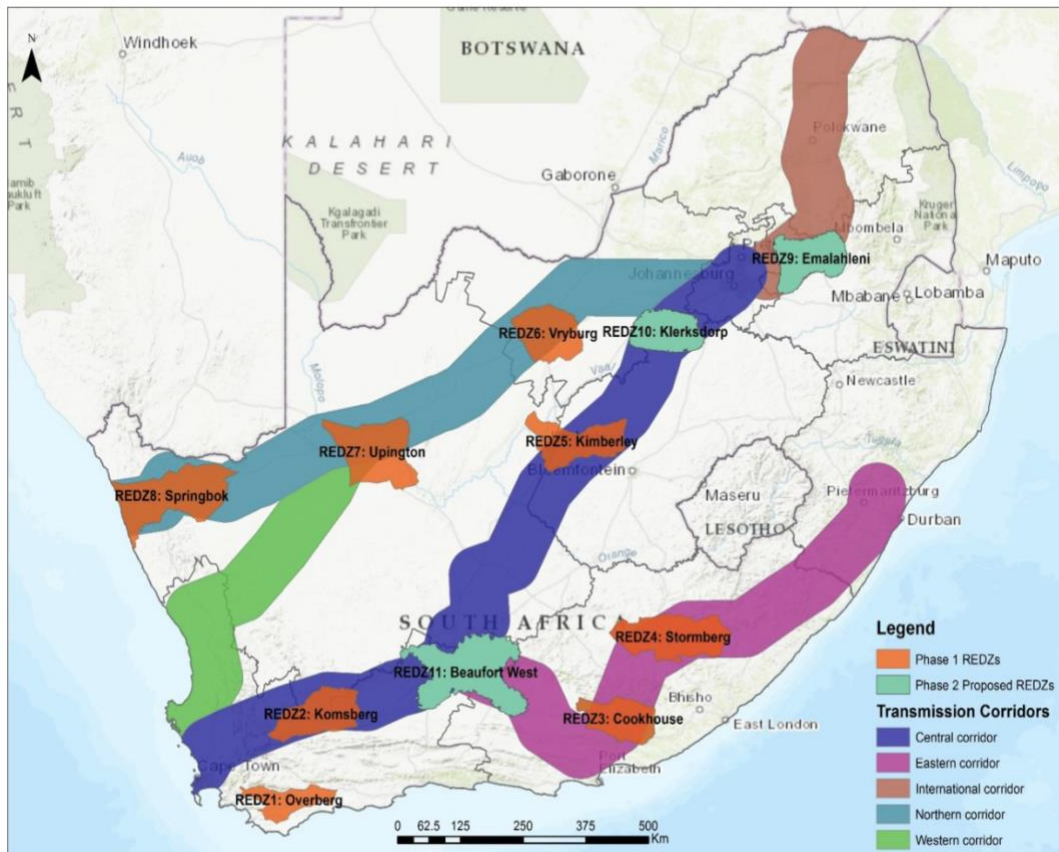


Figure 13: Transmission corridors (EGIS)

As per GNR 113 dated 16 February 2018, “Applications for an environmental authorisation for large scale electricity transmission and distribution facilities, when such facilities trigger activity 9 of the Environmental Impact Assessment Regulations Listing Notice 2 of 2014 and any other

listed and specified activities necessary for the realisation of such facilities, and where the greater part of the proposed facility is to occur in one or more such Strategic Transmission Corridors, must follow the basic assessment procedure contemplated in Regulation 19 and 20 of the Environmental Impact Assessment Regulations, 2014 to obtain an environmental authorisation, as required in terms of the Act". The timeframe for decision making in the Environmental Impact Assessment Regulations, 2014 for purposes of the applications for environmental authorisation contemplated in this Notice is 57 days".

As per Chapter 24 Part 2 of the 2014 EIA regulations, the objective of a basic assessment process is to, amongst others:

- ☐ Determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- ☐ Identify the alternatives considered, including the activity, location, and technology alternatives;
- ☐ Describe the need and desirability of the proposed alternatives;
 - through the undertaking of an impact and risk assessment process, inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural
 - through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to-

4.2. Summary of the Screening Tool

In terms of the "visual impact management and mitigation plan), the submission of a screening report generated from the national web-based environmental screening tool is compulsory for the submission of an environmental authorisation application in terms of Regulation 19 and 21 of the EIA regulations. The table below highlights a summary of key findings of specialist assessment requirements identified for the proposed project in terms of the screening tool (refer to **Appendix E** for a full report).

Identified specialist	Receiving environment	Sensitivity status
Agricultural theme	The project site's land capability varies from low to moderate (06-07)	Medium
Animal species theme	Species that may be present on the project site include the following: <ul style="list-style-type: none"> • Aves-Eupodotis senegalensis 	High

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

	<ul style="list-style-type: none"> • Aves-Tyto capensis • Mammalia-Crocidura maquassiensis • Mammalia-Dasymys robertsii • Reptilia-Kinixys lobatsiana • Invertebrate-Clonia uvarovi 	
Aquatic biodiversity	Note defined as sensitivity is low.	Low
Archaeological and Cultural Heritage Theme	Note defined as sensitivity is low.	Low
Civil Aviation Theme	The site is located between 8-15km from a major civil aviation aerodrome and within 8 km of other civil aviation aerodrome.	High
Defence Theme	There is an existing military defence site that has been identified	Medium
Palaeontology Theme	There are features with a Very High paleontological sensitivity	Very high
Plant Species Theme	Species that may be present on the project site include the following: <ul style="list-style-type: none"> • Melolobium subspicatum • Cheilanthes deltoidea subsp. silicicola • Dicliptera magaliesbergensis • Brachycorythis conica subsp. transvaalensis 	Medium
Terrestrial Biodiversity Theme	The project site is located within the following areas: <ul style="list-style-type: none"> • Critical biodiversity area 2 • Protected Areas Expansion Strategy • Crocodile River Reserve Doornrandje Nature Reserve Cluster 	Very high

4.3. Summary of the Pre-application Process

A pre-application meeting was held with the DEFF on 25 September 2019, whereby the following was resolved:

- ☐ The applicant through the EAP to undertake a public participation process in line with Chapter 6 of the 2014 EIA regulations (as amended); and
- ☐ The applicant to follow a regulatory process for the approval of a 275kV powerline notwithstanding the fact that they are considering to construct it underground.

4.4. Stakeholder Engagement (Public participation) Process

The IFC defines the stakeholder engagement process as an extensive, all-encompassing, and constant interaction between the project Applicant and those potentially affected by the

development activities. Depending on the project phase, the stakeholder's engagement entails a wide range of activities which varies accordingly. From the host country's regulatory framework, the stakeholder engagement process is a public participation process (PPP) regulated under the 2014 EIA Regulation (as amended).

The purpose of the stakeholder engagement process is to ensure that all I&APs are informed about the project from the onset and that the consultative process is clear and transparent to allow for inputs into the project from various stakeholders. PPP, therefore, forms an integral component of this assessment and enables I&APs to identify their issues, concerns, and suggestions during the BA process. This PPP has been structured to provide I&APs with an opportunity to gain more knowledge about the proposed project, to provide input through the review of documents/ reports, and to voice any issues of concern at various stages throughout the BA process. These stages are summarised below.



DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

4.4.1. Public participation process

In accommodating the I&APs' varying needs, various activities were undertaken in line with the EIA regulation, 2014 (as amended). The table below highlights the public participation process undertaken to date in accordance with relevant regulatory requirements.

Reg. No.	The regulatory requirement for Public Participation Chapter 6 of the 2014 EIA Regulations (as amended)	Activity
41	<p>(2) The person conducting a public participation process must take into account any relevant guidelines applicable to public participation as contemplated in section 24J of the Act and must give notice to all potential interested and affected parties of an application or proposed application which is subjected to public participation by-</p> <p>(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-</p> <ul style="list-style-type: none"> 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; <p>(b) giving written notice, in any of the manners provided for in section 47D of the Act, to-</p> <ul style="list-style-type: none"> 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 or 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 or to any alternative site where the activity is to be undertaken; iii. 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; 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; <p>c) placing an advertisement in-</p> <ul style="list-style-type: none"> i. one local newspaper; or 	<p>A site notice was fixed at the site on 09 September 2022. Refer to Appendix XX</p> <p>A written notice was sent to various stakeholders in terms of regulations 41(2)(b) on 09 - 23 September 2022. Refer to Appendix F</p> <p>An advert was placed in the Record newspaper dated 14 October 2022 giving notice to the public about the project,</p>

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

<ul style="list-style-type: none"> ii. any official Gazette that is published specifically for the purpose of iii. providing public notice of applications or other submissions made in terms of these Regulations; <p>d) placing an advertisement in at least one provincial newspaper or national newspaper, if the activity has or may 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</p> <p>(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-</p> <ul style="list-style-type: none"> i. illiteracy; ii. disability; or iii. any other disadvantage 	<p>announcing the public comment of the draft basic assessment report and also the public meeting. Refer to Appendix F</p>
<p>(3) A notice, notice board or advertisement referred to in subregulation (2) must-</p> <p>(a) give details of the application or proposed application which is subjected to public participation; and</p> <p>(b) state-</p> <ul style="list-style-type: none"> i. whether basic assessment or S&EIR procedures are being applied to the application; ii. the nature and location of the activity to which the application relates; iii. where further information on the application or proposed application can be obtained; and iv. the manner in which and the person to whom representations in respect of the application or proposed application may be made. 	<p>Context of the site notice and advertisement are attached in Appendix F</p>
<p>(4) A notice board referred to in sub-regulation (2) must-</p> <p>(a) be of a size at least 60cm by 42cm; and</p> <p>(b) display the required information in lettering and in a format as may be determined by the competent authority.</p>	<p>The site notice placed on site was in compliance with the regulation.</p>

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

42	<p>A proponent or applicant must ensure the opening and maintenance of a register of interested and affected parties and submit such a register to the competent authority, which register must contain the names, contact details and addresses of-</p> <p>(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;</p> <p>(b) all persons who have requested the proponent or applicant, in writing, for their names to be placed on the register; and</p> <p>(c) all organs of state which have jurisdiction in respect of the activity to which the application relates.</p>	<p>The I&APs¹ register is attached in Appendix F.</p>
43	<p>(1) A registered interested and affected party 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 that party believes may 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.</p>	<p>This document serve to give opportunity to I&APs in accordance with this requirement.</p>
44	<p>(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.</p>	<p>Refer to section 4.4.2 below of comments received to date and responses thereto. These have been included in the public participation report attached in Appendix</p>

¹ I&AP's contact details and emails address have been omitted in this draft basic assessment report in compliance with POIA

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

4.4.2. Comments and Response

The table below highlights comments raised on the project to date as well as the responses.

Comments received	Comments by:	Response
<input type="checkbox"/> Security at this site should be 24/7 as we don't want to attract more criminals. <input type="checkbox"/> Access road should not be damaged; we expect that the access road will be improved and maintained. <input type="checkbox"/> Environment to be kept clean and no impact.	Louise Erasmus, Plot 21, Doornrandje	<ul style="list-style-type: none"> • Permanent (24/7) security presence at site • The access road will be maintained and improved (where necessary) • All relevant South African legislated, requirements of the Environmental Management Program, IFC Standards and Equator Principles environmental and social standards/requirements will be strictly followed and complied with.
<input type="checkbox"/> As the co-owner of plot 111 Doornrandje 386 j.R. I am in support of the proposed BESS on our property. Compared to other development applications in the area, this is a low impact development, and anything that helps improving our electricity supply is highly welcome.	Mr Niko Knigge, Co-owner of Plot 111 Doornrandje	<ul style="list-style-type: none"> • The Reserve will also benefit from added security presence and localised fire-fighting equipment
<input type="checkbox"/> The above-mentioned project has come to my attention, and I would like to know what the final date is for the closure of the public participation process. <input type="checkbox"/> Noted with thanks, but can you give me dates?	Stephen Prumm, Plot 61 Doornrandjepl	<ul style="list-style-type: none"> • We are in the early stages of public participation in the project and will release a Draft Basic Assessment Report for public comment in October. • The plan is to release the Draft Basic Assessment Report during the first week of October and this will be confirmed via newspaper notice advert to be released in the last week of September.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

<p>❑ Hi can you please add me to the data base as an interested and affected party.</p> <p>❑ It is 26/09/2022 and I require the exact date when the PPP expires on the BESS project D111, or if not available then the exact starting date of the PPP</p>		<ul style="list-style-type: none"> • Please note that your email has been received and we registered you on the list as an I&AP of the proposed BESS project on Portion 111 of the farm Doornrandje • Thank you for your email and interest in the project. <p>Please note that as per the 2014 EIA regulations (as amended), which we are guided by to conduct the public participation process, we are required to conduct public participation as follows:</p> <ol style="list-style-type: none"> 1. First step: distribution of background information and placement of site notice (this step has been done) 2. Second step: send a stakeholder notification and publish an advert informing stakeholders of the availability of a draft report (including comments received to date). Typically, this also details aspects of meetings which usually takes place during the commenting period of 30 days to which stakeholders submit their comments on the draft report. This is our second step which should have been taking place this week; however, due to delays in some of the specialist studies, this will move, and such will be communicated in due course. 3. Third step: compile comments and responses based on the public meeting and all comments received. This will be included in the final report to be submitted to the department for approval. Should stakeholders raise further comments once the final report has been submitted, or can these be submitted directly to the department? 4. Once the project has received an environmental authorisation, stakeholders cannot submit comments but rather an objection through an appeal process.
---	--	---

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

		Please note the Basic Assessment process is legislated to take between 90-147 days, depending on the process to be followed. However, this can be shortened depending on how the consultants are progressing. However, they are not exempted from a 30 public review of the report.
<input type="checkbox"/> Received, thank you. Please keep me posted on further developments. I am not principally opposed but as it is potentially an eye sore at the beginning of the reserve, I am curious to learn how it will be camouflaged and whether the reserve will be able to benefit from the project directly via improved roads, access control, security, donations, electricity supply reliability,	Hans & Katarina Von Stockhausen 2RK	<ul style="list-style-type: none"> • The intention is to screen the plant from the road with indigenous vegetation and low-visibility fencing • The plant itself will provide the region with benefits of power storage and grid stability which will contribute to reduced load-shedding
<input type="checkbox"/> I own the neighbouring property to the proposed site of this project. I see no benefit to the local community for this project to be built in this area. <input type="checkbox"/> Keep the nature reserve untouched of find another place to erect this.	22 Gemstone Road, Doornrandjie	<p>As a responsible resident of the Reserve the development will be an active participant in matters relating to the Reserve and will contribute financially and technically to ensure the ongoing viability of the CRR in confronting the many challenges which it faces. Specifically, the Reserve will benefit from</p> <ul style="list-style-type: none"> • 24/7 security presence, • localised fire-fighting equipment and fire management assistance maintenance of access roads to the site • Participation in community programmes identified by CRR/GSA, e.g. education outreach
<input type="checkbox"/> Our main concern currently would be the destruction of the fauna and flora in a critically endangered grassland.	Stephan and Dalene van Der Merwe Plot 30 Bodley Ave Ext Doornrandje	<ul style="list-style-type: none"> • A BA process is being undertaken to the highest standards and in compliance with South African legislation. This includes numerous specialist studies (e.g., biodiversity, noise impact, Safety health and environment risk assessments etc.) to ensure that the project is developed in compliance with relevant legislation.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

<input type="checkbox"/> Further concerns would be the maintenance of roads used, the visual impact, light and noise pollution, fire hazard, and security since batteries would be very desirable items to steal.		<p>Specifically, the Reserve will benefit from:</p> <ul style="list-style-type: none"> • 24/7 security presence, • localised fire-fighting equipment and fire management assistance maintenance of access roads to the site • Participation in community programmes identified by CRR/GSA, e.g., education outreach
<input type="checkbox"/> Email acknowledged <input type="checkbox"/> However, we need an EIA report not BID report to review and provide formal comments on the application. <input type="checkbox"/> Kindly share the copy of the Basic Assessment report for our review in order to provide formal comments on the application <input type="checkbox"/> Kindly note that the EIA report is not yet available for this application	Kemmone Mofela, City of Tshwane Metropolitan Municipality	<ul style="list-style-type: none"> • The Environmental Impact Assessment Basic Assessment Report (together with the specialist studies) will be made available when completed
<input type="checkbox"/> Please register the people listed below as interested and affected parties in the proposed development. Regards Richard Angus <ul style="list-style-type: none"> ○ Richard Angus richard.bonathaba@gmail.com ○ Stella Angus (contacts as above) ○ ShaneRorke shane109rorke@gmail.com ○ Rose Rorke rosemaryrorke@gmail.com 	Richard Angus, Resident of Doornranjie	<ul style="list-style-type: none"> • Comment well noted thank you.
<input type="checkbox"/> BID noted thank you. Please send us a link of your report when its ready for comments.	Rudzani Mukheli, City of Tshwane	<ul style="list-style-type: none"> • Comment well noted thank you

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

	Metropolitan Municipality	
<p><input type="checkbox"/> I attach hereto the completed Reply Sheet in the BID Document, together with a pdf file attached with comments from the Grassland Stewardship Alliance as input to the Environmental Impact (Basic Assessment) Process and Public Participation.</p> <p><input type="checkbox"/> Please acknowledge receipt. We reserve the right to make additional inputs once the Basic Assessment Report is available.</p> <p><input type="checkbox"/> Our comments and questions on the development, which requires a full EIA report including mitigation of biodiversity impacts, are as follows:</p> <p><input type="checkbox"/> It should be noted that the landowners of Portion 111 of Doornrandje Farm had previously informed the GSA of the potential development on their land within 5 years. As required by NEM: PAA the potential development was included in the section: Doornrandje Management Unit Potential Developments, of the CRR Integrated Management Plan (IMP). This does not imply that the GSA as the Management Authority of the CRR gave an a prior consent to the development or that the Environmental Authorities will approve the development without assessing a full EIA Report.</p>	<p>Jenny Cornish Deputy Chair of Crocodile River Reserve Grassland Stewardship Alliance, 61 Gemstone Road, Rietfontein 532JQ</p>	<ul style="list-style-type: none"> • Comment well noted thank you • The contractor will be monitored by an independent consultant throughout construction against the accepted SHE plan

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

<ul style="list-style-type: none"> ○ How will the impacts during the development and construction of the required operational and associated infrastructure be contained? ○ What safety procedures during the development of the infrastructure and during operations, including “unexpected” accidental damages to the environment, will be put in place? ○ What security procedures during the development and during operational activities will be put in place? ○ How will the considerable visual impact of the whole infrastructure be mitigated? ○ How will the disruption during construction of the BESS be contained? ○ The impact on biodiversity degradation that certainly will result from the development of the BESS might call for a biodiversity offset. Has this been considered? <p>❑ In addition, the assessment and mitigation of the potential impacts on the whole community during the development of the</p>		<ul style="list-style-type: none"> • A full SHE plan is part of both the EPC (construction) and O&M (operations) contract • Full-time on-site security • Screening with indigenous flora (refer to Appendix XX for a detailed visual impact management and mitigation plan) • There will obviously be some disruption during the relatively short construction period. The construction plan will include traffic and logistic studies to avoid unnecessary disruptions • Yes, the options will be considered once the biodiversity study is complete All reasonable steps will be taken to ensure that biodiversity is not adversely impacted and positively offset if required • Noted • The maximum footprint will be no larger than 3.5ha.. • The development represents less than 5% of the area of the portion of land where it is located, which is a lower total
--	--	--

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

<p>infrastructure and the operations of the BESS must also be considered.</p> <ul style="list-style-type: none"> <input type="checkbox"/> In the BID document it is also noted that the BESS will cover around 3.5 Ha of land in comparison to the 3500 Ha of the CRR. This comparison seems to imply that one thousandth of biodiversity destroyed by the development is negligible. Any amount of destruction of biodiversity is impactful. <input type="checkbox"/> Furthermore, each portion of privately owned land in the CRR is individually declared under NEM: PAA. The portion of land where the BESS is situated is 68.5 Ha in size and therefore the BESS coverage should be stated as part of that portion only. 		<p>development footprint than many of the properties in the reserve</p>
<ul style="list-style-type: none"> <input type="checkbox"/> Please register myself as an Interested & Affected Party in respect of the above-cited proposal. <input type="checkbox"/> I am a resident of the Farm Doornrandje. <input type="checkbox"/> Please acknowledge receipt of this request and my registration as an I&AP. 	<p>Nick Foster Resident of the Farm Doornrandje</p>	<ul style="list-style-type: none"> • Email acknowledged and the stakeholder registered.
<ul style="list-style-type: none"> <input type="checkbox"/> Please find attached, Completed Comments and Registration Form for the proposed Battery Energy Storage System on Portion 111 (a portion of 19) Doornrandje. 	<p>Mr Francius and Tanja Gomes-Sebastian Sweetwaters Property 209 Portion 51 Doornrandje</p>	<ul style="list-style-type: none"> • Email acknowledged and the stakeholder registered.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

<p>The crocodile River Reserve has proclaimed as a Protected Area to the National Environmental Management: Protected Areas Act of 2004 which provides for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes, seascape, and the management thereof.</p> <ul style="list-style-type: none"> ❑ This development will destroy the biodiversity of the area being classified as a protected area. ❑ The proposed development will not only be an ecological threat and impact the biodiversity of the area but will also diminish the value of the adjoining properties as the value of the properties linked to the natural beauty and protected area classification. ❑ The proposed development will also increase the fire risk in the area due to the nature of the equipment and increase the risk of violent crimes as the equipment is a high commodity item for criminals. ❑ The proposed development will also impact the appearance of the area which is reliant on the natural un-developed protected environment. 	<p>Mrs Christel Steyn-McRobie Owner of Portion 45 of the farm Doornrandjie</p>	<ul style="list-style-type: none"> • We are aware that a project of this nature will to a certain extent impact the biodiversity. As such, a biodiversity impact assessment was undertaken and details of such a study has been highlighted in Chapter 5 of the Basic Assessment report. • Please see response above. • As part of this basic assessment report, the a fire prevention management plan has been compiled to address any fire related risks attached as an Appendix 4 of the Environmental management project • The developer has drafted a visual impact management and mitigation plan aimed at addressing the visual impact of the
---	--	--

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

		proposed project. Kindly refer to Appendix G of the BA report for detailed information.
<p>Objection to the proposed installation of the BESS (battery power station) in Doornrandje</p> <p>❑ The Doornrandje community enthusiastically supports the development of all forms of renewable energy. We recognise the importance of using wind, solar and tidal technologies for power generation to reduce levels of greenhouse gasses. However, we have grave concerns about the negative environmental and amenity impact of the battery power station being proposed at D111 and across the surrounding reserve. There are alternative brownfield sites available and distributed generation is both possible and more desirable.</p> <p>❑ Those concerns are:</p> <p>Unprecedented scale,</p> <p>What is being proposed inside our biodiversity reserve is an extremely large industrial development. A development of this scale cannot fail to have a profound negative effect on the environment and reduce the economic and amenity value to those both living in and using the area.</p> <p>Site enlargement</p> <p>The developers have included a plan of the proposed BESS and associated</p>	<p>Mr. Chris Angles Property owner in the Crocodile River Reserve</p>	<ul style="list-style-type: none"> • We note your comments, please note that the site was selected due to its proximity to the Eskom 88 and 275kV which runs adjacent to the proposed project site. We do support wind, solar and tidal energy source hence we are proposing these projects which are meant to address the variability of renewable energy projects. Due to their variability renewable energy sources are not able to provide the much-needed power during peak hours. This project will be able to provide power during peak hours because they will be charged during off peaks hours and transmit the power during peak hours reducing the variability of renewable energy as such reducing loadshedding events. • We are aware that a project of this nature will to a certain extent impact the biodiversity. As such, a biodiversity impact assessment was undertaken and details of such a study has been highlighted in Chapter 5 of the Basic Assessment report.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

infrastructure but fail to mention the actual space the installation will occupy across the proposed 3ha development of the site(as if this in some way reduces their impact) and to include the extra land and BESS as part of their calculations concerning the benefit to the environment that they suggest the power station will create. This raises serious issues responsibilities and wider governance.

The governance of the BESS

We are concerned about the management of such infrastructure. Management of such installation is critical and without oversight. We are not confident that the incentives of the developer and operator would ensure the long-term protection of the site.

Archaeology

The site and its immediate environs make an important contribution to the historical environment and cultural setting of the area and the creation of a large power station albeit will change the settings of the area drastically.

Noise & Disruption

The community in the direct vicinity of the planned development is concerned about the level of the disruption that will occur

- The overall project development including associated infrastructure will have an extent of 3ha in size.
- This project is part of government's initiatives to reduce load shedding. The ownership and management thereto lie with the Project Company to be formed prior to construction.
- Kindly refer to Chapter 5 of the BA report and also Appendix B3 & 4 which details the archaeology of the site which has been rated as low as such no impact anticipated through the proposed development.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

during construction and continue during the normal running of the power station. Although there is some technical detail, we have seen little intelligible analysis of the cumulative level of noise generated by the inverters, transformers, battery packs and other elements of the energy production process.

Access & Traffic

This is a very large site that would not only be covered with new battery installations but would also require substantial works to provide roads, new ditches and the electrical plant including a substantial compound for battery storage. The Doornrandje community is concerned that the roads to the site in particular Gemstone road, is not suitable for the weight and frequency of the traffic required to transport such high volume of materials and equipment to the site. We are unclear about the future responsibilities for road maintenance, repair, and general restitution.

Landscape, Amenity and Economic Value

The site forms part of the Crocodile River reserve. The site is visible from long distances including Hennospvallei, the R511 coming from Hartbeespoort, etc – all

- Kindly refer to Chapter 5 of the BA report and also Appendix B5 which details the noise impact of the proposed development. Furthermore, mitigation measures and management of impacts are details in Appendix G.
- Similar to any project of this size, an Engineering, Procurement and Construction (EPC) contractor is appointed to manage the construction phase. Prior to construction the contractor will be required to compile a traffic management plan which will details how traffic will be managed together with the maintenance of the road.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

which have extensive view encompassing the whole reserve and adjoining areas. It is an area of high amenity and economic value.

Our Judgement

As we have made clear, this large battery power station will have a profound negative impact on the people that live in the Doornrandje and the surrounding Crocodile River reserve. Although it is these local people who will suffer the losses if this development goes ahead, it appears that as currently conceived, it provides no direct benefit for them either in the short or long term. Instead, there is a great risk that such development would increase crime in the area, devalue property value, increase traffic in the area, put great strain on already poor road infrastructure, increase noise pollution, without bringing any real benefit to the community.

Electronic notification of the project was only received on 19 October 2022

Comments, concerns, and queries will be submitted once the documentation has been studied. At this stage it should be recorded that I object to the project.

- The developer has drafted a visual impact management and mitigation plan aimed at addressing the visual impact of the proposed project. Kindly refer to Appendix G of the BA report for detailed information.
- The basic assessment process in accordance with the regulatory framework, is a process aimed at assessing environmental and social impacts of a project (both negative and positive). This process is also an opportunity for stakeholders to voice their concerns which incorporates the three pillars of sustainable development being environment, social and economic. The economic part of the project is highlighted in section 2.6 of the BA report.

CHAPTER 5: THE RECEIVING ENVIRONMENT

5.1. Geographical setting

The project site is located with the City of Tshwane Metropolitan Municipality. City of Tshwane is classified as a Category A municipality by the Municipal Demarcation Board in terms of Section 4 of the Local Government Municipal Structures Act, 1998 (Act 117 of 1998). The Municipality was established on 5 December 2000 by integrating various municipalities and councils that had previously served the greater Pretoria regime and surrounding areas.

The incorporation, which gave birth to the new City of Tshwane in May 2011 after the local government elections, was in line with the Gauteng Global City Region Strategy to reduce the number of municipalities in Gauteng by the year 2016. Incorporating the areas mentioned above enlarged the area, which covers to an extent of 6 345 km². The extent of this can be practically explained in that the city stretches almost 121 km from east to west and 108 km from north to south and it also makes up more than 30% of Gauteng which is 19 055 km² in extent.

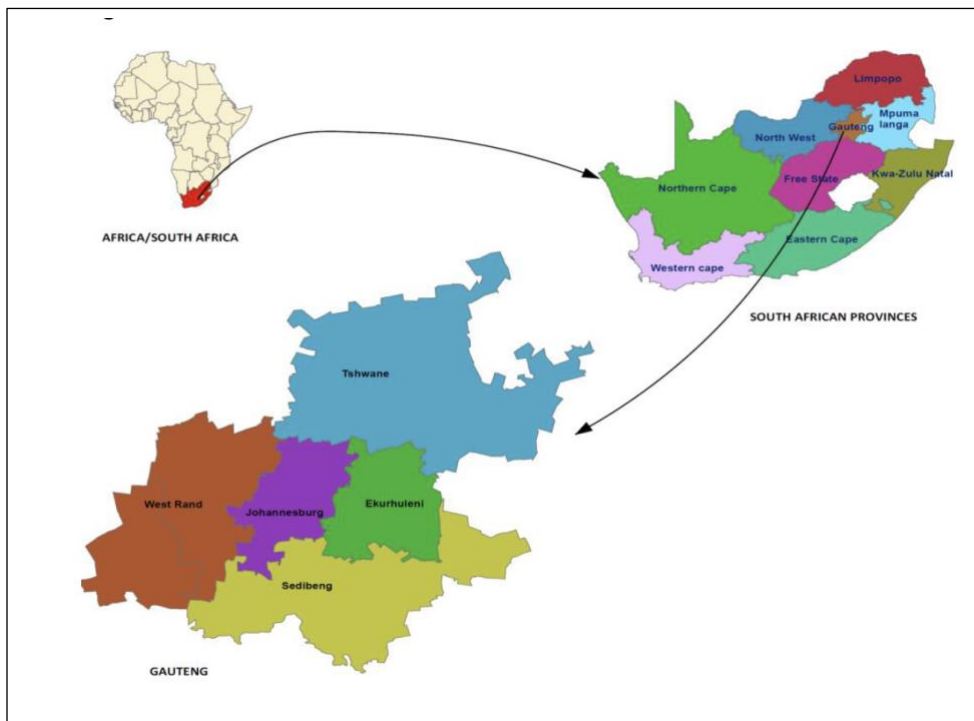


Figure 14: Locality map of City of Tshwane

5.2. Physical aspect

5.2.1. Geology

The underlying geology of the site comprises Malmani Dolomites, with bands of Black Reef Quartzites and Halfway House Granites to the south of the site. Malmani Dolomites is a subgroup, of the Chuniespoort Group of the Transvaal Supergroup. The Transvaal Supergroup is an extensive geological sedimentary rock sequence extending across much of the northern part of South Africa and into Botswana (Ericksson & Altermann, 1998). The Malmani Dolomites are just one rock formation in this sequence, and they are of general interest because of the historic lime mines, and thus palaeocave fossil deposits. This formation has been formed 2.6 – 2.5 billion years ago, making it one of the oldest formations known.

Dolomite is a type of limestone rock that forms in warm, shallow seas from the slow accumulation of the remains of marine microorganisms and fine-grained sediment. It differs from other limestone rocks in having a higher magnesium content, and these dolomites are also characterised by fossils of algae formations that are known as stromatolites. These materials contain high levels of calcium carbonate, and thus such rock formations are often referred to as carbonates. One important quality of dolomite is that, over long periods of time, this rock is water soluble – ground water is a weak acid that will erode away the calcium carbonate matrix as it percolates through cracks and fissures within dolomite rock layers. This process results in the development of underground solution cavities, eventually breaking through to the surface due to erosion or collapse, where they form caves and sinkholes.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

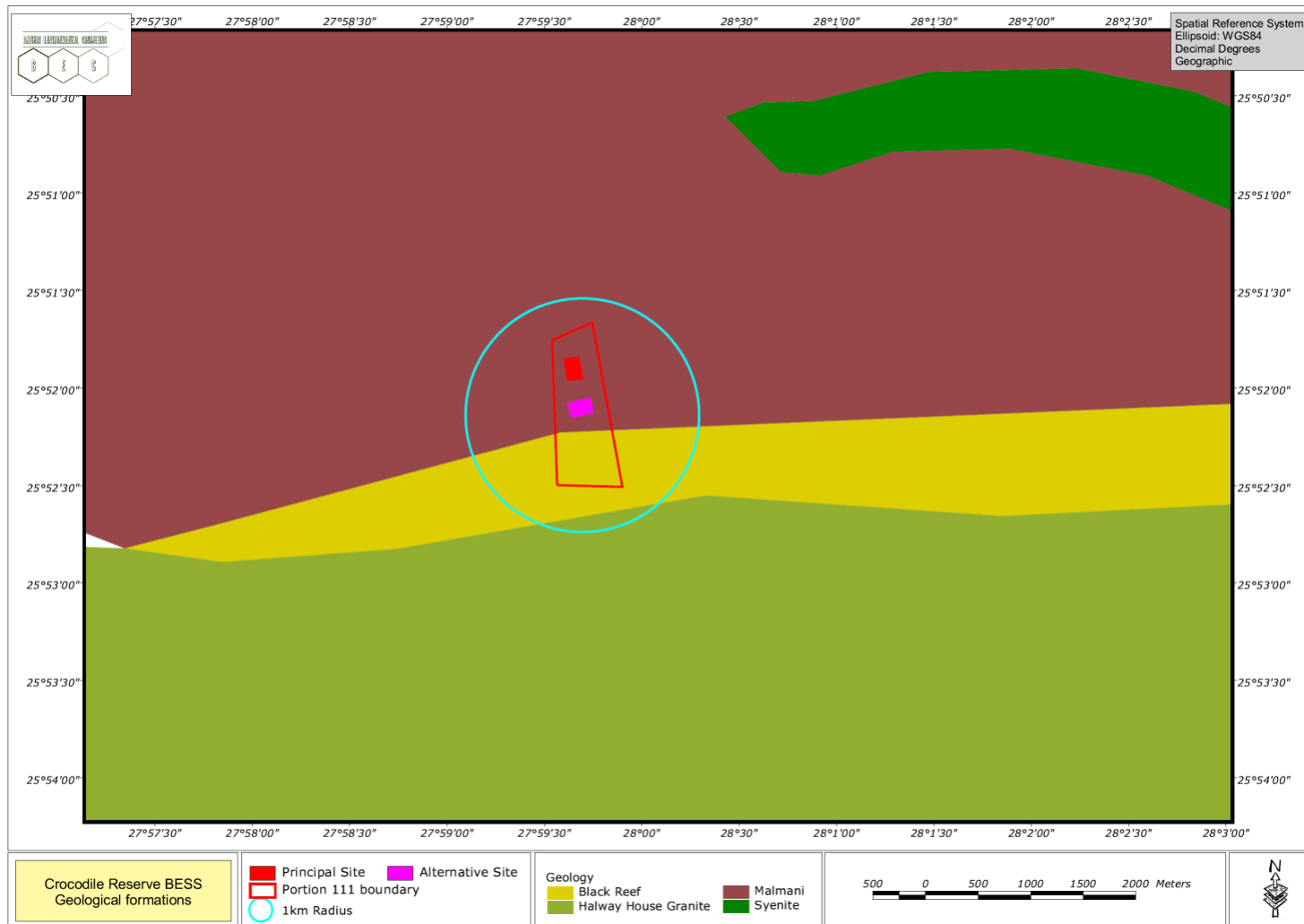


Figure 15: Project site overlain on the geological map

5.2.2. Topography, relief and slopes

The properties within the area started off as commercial farms focusing on the production of crops and the raising of livestock. Most of these farms were later sub-divided into small holdings which supported a wide range of businesses and activities. The proposed project area is a 3,5-ha situated about 2km east of the R511 along Gemstone Road, Centurion. The study area consists of an open field sloping down in the direction of the Hennops River or one of its tributaries. It is overgrown with a thick layer of grass limiting heritage visibility. The area is rocky with large outcrops of Dolomite visible within the study area with powerlines located along the eastern edge of the proposed project area.

The term 'ridge' loosely refers to hills, koppies, mountains, kloofs, gorges, etc., this is a result of similar biodiversity, ecological and aesthetic values. The essential characteristic defining these topographic features is the slope of the site, whereby any topographic feature in the landscape that is characterized by slopes of 5° or more (i.e. > 8.8%, > 1 in 11 gradient), as determined by means of a GIS digital elevation model, is defined as a ridge. Ridges in Gauteng have been classified into four classes based on the percentage of the ridge that has been transformed (mainly through urbanization) using the 1994 CSIR/ARC Landcover data. It is important to note that, although rocky outcrops are not covered by the policy, they are nonetheless regarded as sensitive areas characterized by high biodiversity and as such, a no-go development policy should be applied. The spatial information indicates the presence of Class 2 ridges approximately 350 m east and 500 m from the proposed battery site, which elevates the sensitivity of the areas that will be crossed by overhead lines. Class 1 ridges are spatially situated further to the north, northwest, and southwest of the site, but is not anticipated to be affected by the proposed activity.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

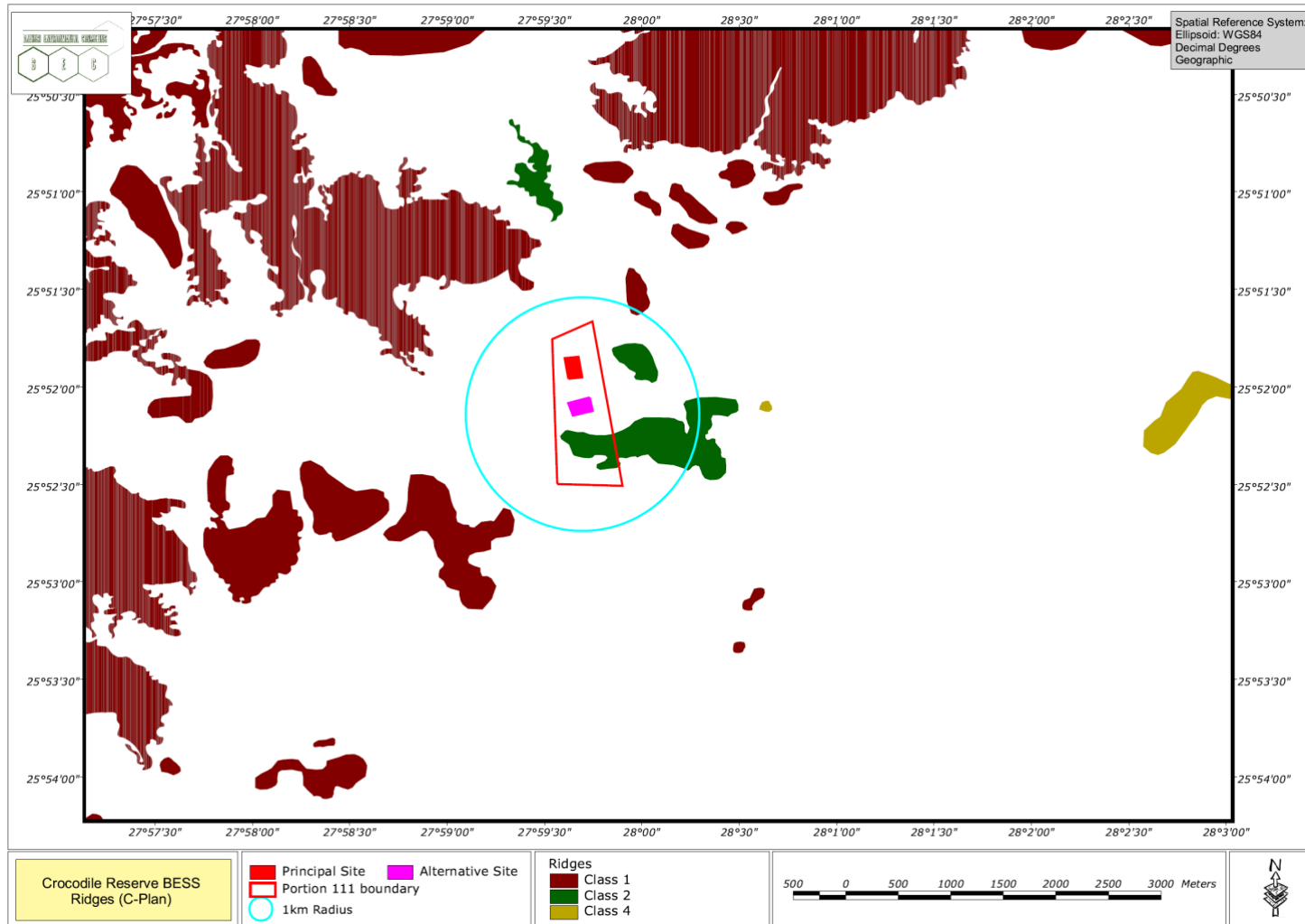


Figure 16: Project site overlain on the topographical map

5.3. Biological aspect

5.3.1. Landcover and Land-use

The Grassland Biome of South Africa exhibits a high development potential and natural habitat is under severe and constant threat from anthropogenic-induced habitat transformation. Highly developed urban areas, such as the Johannesburg-Midrand-Pretoria complex, exemplify these threats. Typical responses manifest as gradients of habitat deterioration, ultimately terminating as sterile areas with extremely little ecological functionality, species richness or any propensity for biodiversity purposes. Other than being unquestionably deleterious, there is a general lack of understanding of the exact effect of land changes on natural habitat within urban environments.

The proposed site is situated within the City of Tshwane Municipality, approximately 6.5 km north of Diepsloot, and 4.25 km west of Copperleaf Golf Estate. The BGIS information source indicates the extent of the City of Tshwane Municipality as approximately 217,457 ha of which an estimated 58.25 % is already entirely transformed. The wider region is clearly an urbanised and developed region, characterised by extensive anthropogenic habitat transformation through urbanisation. However, extensive areas of remaining natural and pristine habitat remains in the immediate region of the site. Urban developments are noted to the east and southeast of the site, characterised by a well-developed road network. From a wider perspective it is noted that the site is situated on the perimeter of the highly urbanised region, which include Centurion, Midrand, Muldersdrift, Krugersdorp and Diepsloot, while areas to the north and west largely comprises lower levels of anthropogenic disruption and transformation.

Aerial imagery of the site and immediate surrounds indicates a moderately fragmented landscape on a local scale, characterised by smallholdings and small-scale agriculture and localised residential areas. Isolated occurrences of exotic plantations and stands of exotic trees are often noted in proximity to these residential areas. Ultimately, natural grasslands, wetland and ephemeral grassland types that are typically associated with the highveld region and areas of local topographical variability and exposed surface rocks, dominate the undulating landscape, exhibiting a moderate to high ecological integrity and moderate to low fragmentation characteristics.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

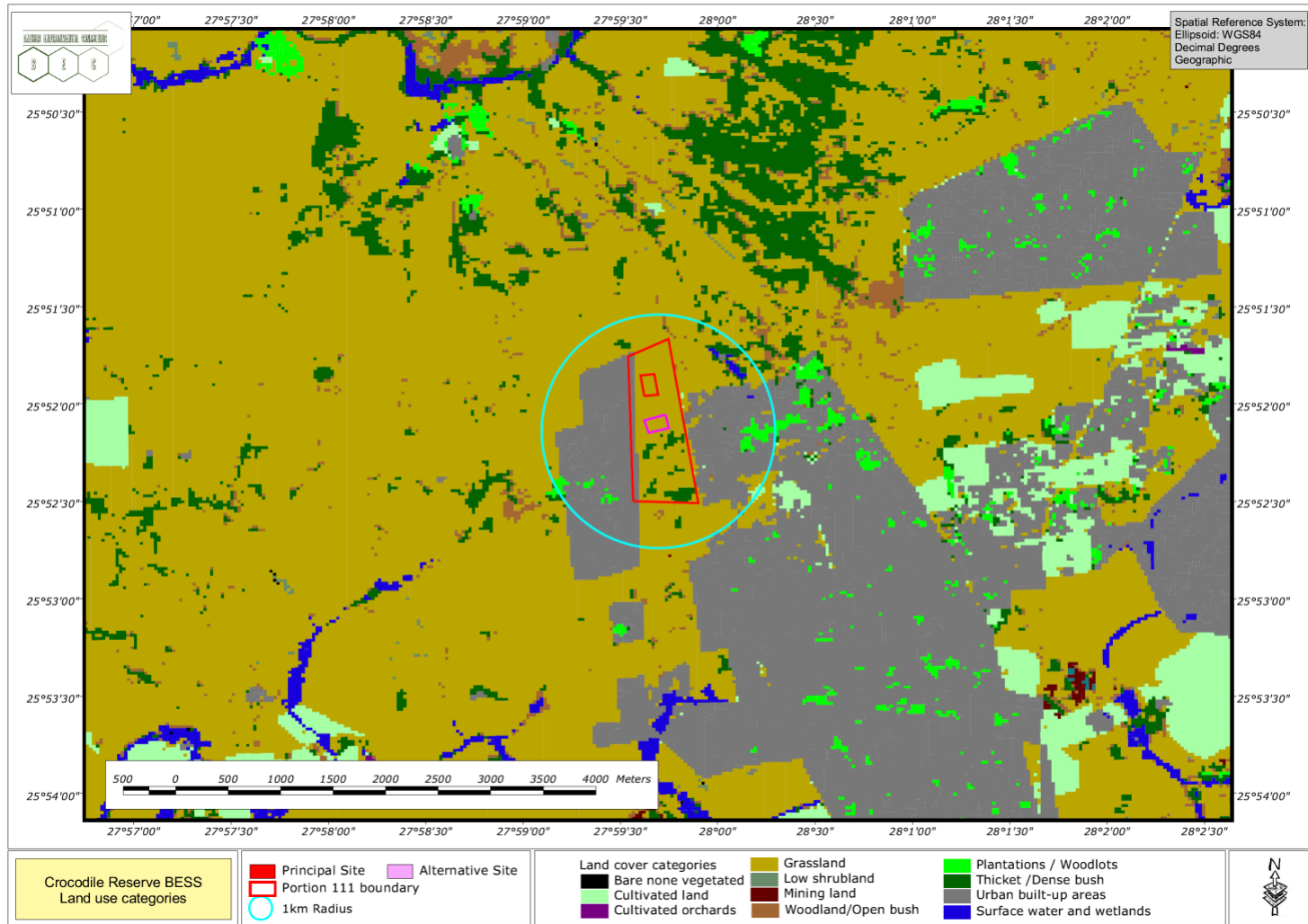


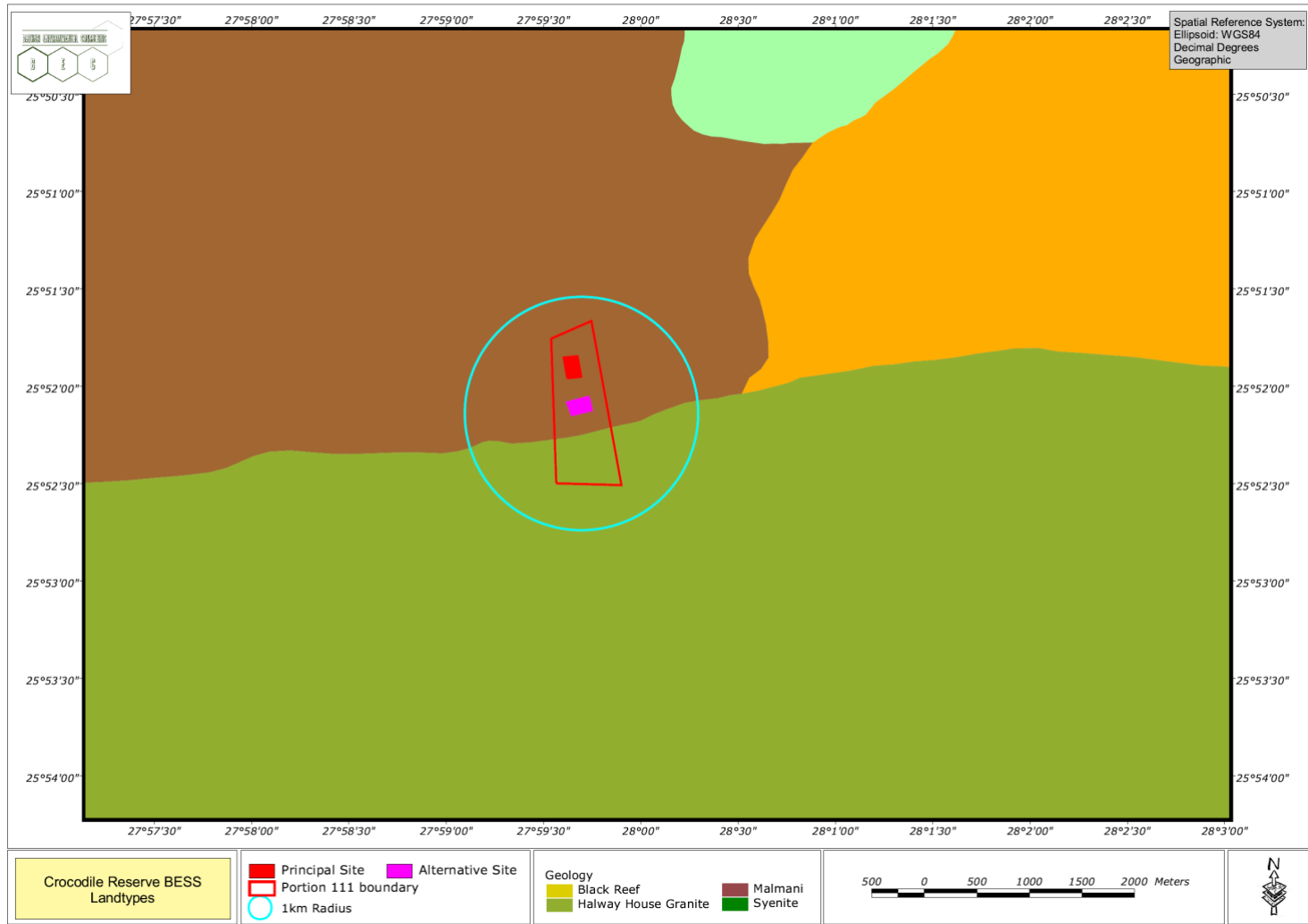
Figure 17: Project site overlain on the Land use map

5.3.2. Soils and agricultural potential

The site is situated across the Bb and Fa land types (refer Figure 6). Bb refers to a plinthic catena where duplex and marginalitic soils are rare, while dystrophic and/or mesotrophic and red soils are limited. Soil types that might occur in a perfect catena include the following: gley soils, for example, the Katspruit form with a shallow water table, will dominate in lowland areas. Higher on the slopes, the permanently saturated gley soils will make way for soils that are formed under temporary saturated conditions and still higher soils with no traces of water and soils with a lack of water in their pedogenesis. In these circumstances, soil forms will vary, starting with the Katspruit soil form, moving on to the Westleigh (plinthic soil), then to Clovelly and Hutton and lastly, Glenrosa and Mispah soil forms. Plinthic soils must occur more than 10 % of the time to be included in this land type, while upland duplex and marginalitic soils are absent or occupy less than 10 % of the area. Upland marginalitic soils have one or more Arcadia, Bonheim, Tambankulu, Mayo and Milkwood soil forms. Duplex soils include Estcourt, Sterkspruit, Swartland, Valsrivier and Kroonstad forms. Unit Bb indicates land in which red/or yellow apedal soils (Hutton, Bainsvlei, Avalon, Glencoe and Pinedine soil forms), that are dystrophic and/or mesotrophic, do not predominate. Rocky areas (Rock complexes and Mispah soil form) alternate with areas of deeper soils (predominantly Hutton soil form), and the clay content of the soils varies between 20 % and 40 %.

The F type often comprises mostly Glenrosa and Mispah forms. This group is intended to accommodate pedologically young landscapes that are not predominantly rick and not predominantly alluvial or aeolian in which the dominant soils forming process has been rock weathering, the formation of orthic topsoil horizons and, commonly, clay illuviation, giving rise typically to lithocutanic horizons. The soil forms that epitomise these processes are Glenrosa and Mispah. However, exposed rock and soils belonging to almost any of the other soil forms may be found in these land types, provided these other soils do not qualify the land for inclusion in another map unit. Shale and deep soils of the Oakleaf forms (usually on upland sites) developed by rock weathering are accommodated here. Fa refers to land in which a line in the soil is not encountered regularly in any part of the landscape.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

**Figure 18:** Project site overlain on the soil and agricultural potential map

5.3.3. Wetlands and surface hydrology

Areas of surface water contribute significantly towards the local and regional biodiversity due to atypical habitat that is present within ecotonal areas. Ecotones (areas or zones of transition between different habitat types) are occupied by species occurring in both the bordering habitats, and are generally rich in species due to the confluence of habitats. In addition to daily visitors that utilise the water sources on a frequent basis, some flora and fauna species are specifically adapted to exploit the temporal or seasonal fluctuation in moisture levels in these areas, exhibiting extremely low tolerance levels towards habitat variation. Ecotonal interface areas form narrow bands around areas of surface water, and they constitute extremely small portions when calculated on a purely mathematical basis. However, considering the high species richness, these areas are extremely important on a local and regional scale. Rivers also represent important linear migration routes for a number of fauna species as well as an important distribution method for plant seeds.

The study area is situated within the Limpopo Catchment Area with several non-perennial streams noted from the wider region², although no drainage lines are situated within the proposed site. These non-perennial streams generally drain northwards into the Hennopsrivier (refer Figure 8).

² For a detailed discussion of the surface hydrology of the receiving environment, the reader is referred to the wetland report.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

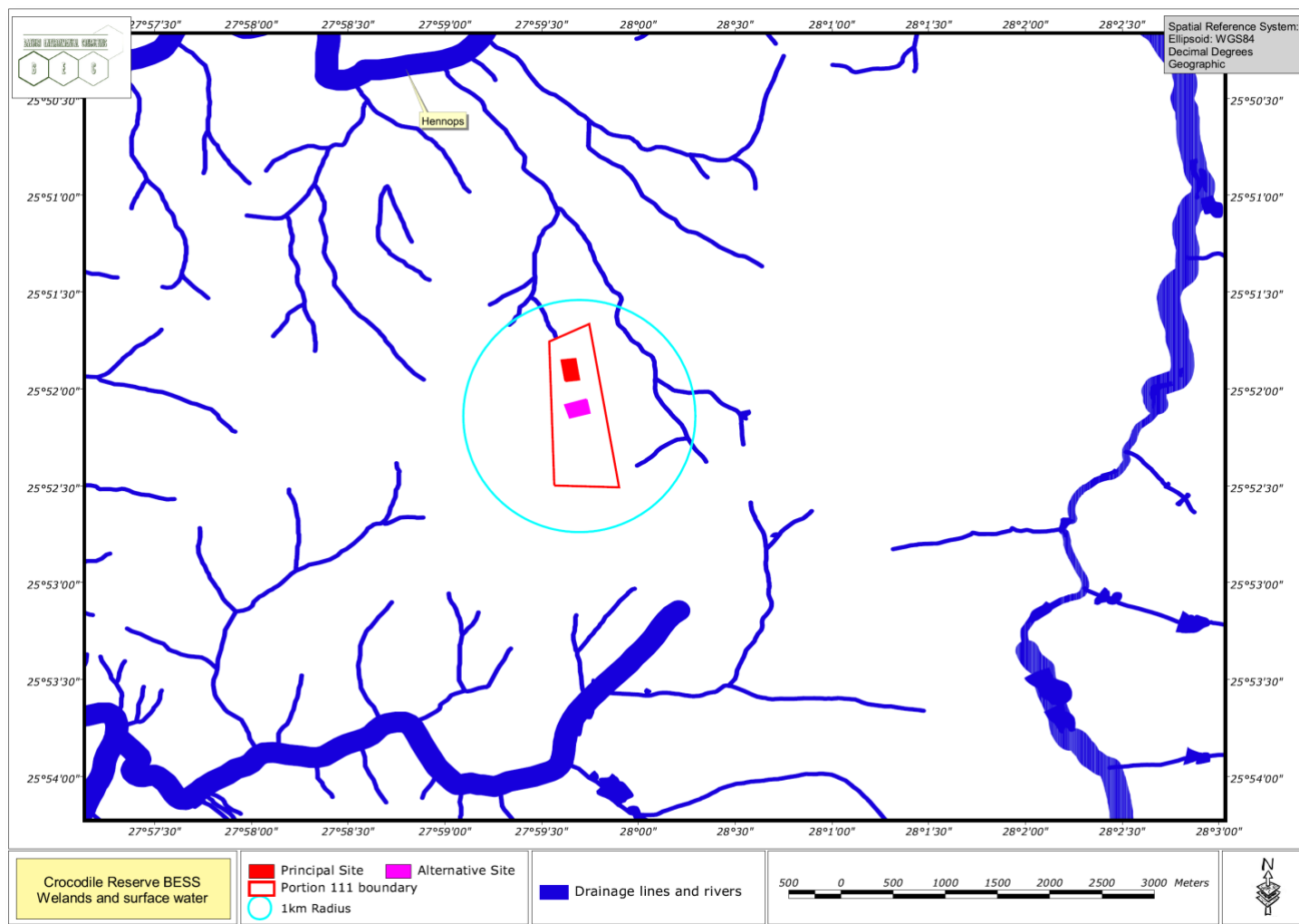


Figure 19: A surface water map highlighting watercourses around the project site

5.3.4. Biodiversity (Flora)

The study area is spatially situated in the Mesic Highveld Grassland Bioregion (Mucina and Rutherford 2001). While it is principally sympatric to the Carletonville Dolomite Grassland, elements of Egoli Granite Grassland, which is situated immediately to the south of the site, are represented in the study area (refer Figure 11), indicating an ecotonal zone with vegetation corresponding to both types. However, the geological formations and dolomitic surface rock from the site would indicate Carletonville Dolomite Grassland as the dominant type.

A brief survey of the proposed site during September revealed a floristic species richness of at least 107 plant species (refer Appendix 1). Although corresponding (numerically) to only 11.2 % of the sampling records from the wider study area (refer Section 18.1), the site nonetheless exhibit a high floristic diversity and high correlation to pristine forms of the local ecological type (Carletonville Dolomite Grassland). The high floristic diversity of the site should also be considered in context with the comparative small size of the survey area as well as the instantaneous nature of the survey. A collage of images of selected plant species is presented in Appendix 2.

A brief review of growth forms recorded from the site assessments provides insight into the physiognomy, species richness and diversity patterns on a local scale (refer Graph 5). The herbaceous and graminoid life forms overwhelmingly dominate the species richness with 31 (29.0 %) and 21 (19.6 %) species respectively, which also correlate to the wider region (refer Graph 1). Typical grassland growth forms, such as geophytes (31 species), dwarf shrubs (10 species) and prostrate herbs (9 species) are prominent, reflecting typical and pristine grassland habitat, while woody plants, including trees and shrubs, occur at low abundance levels. It is also mentioned that hydrophilic species, such as sedges, ferns, and other Cyperaceae species, which are typically encountered in ephemeral grasslands and wetland habitat types, were generally found to be absent from the site.

A total of 38 plant families were recorded during this survey bout, typically dominated by the Poaceae family (grasses, 21 species, 19.6 %), Asteraceae (17 species, 15.9 %), Fabaceae (14 species, 13.1 %), and Hyacinthaceae (6 species, 5.6 %). A total of 30 plant families have representation of either 1 or 2 species, also correlating to the regional types.

It is thus evident that the floristic composition and structural aspects recorded from the site strongly correlates to the regional ecological types. Although a Least Concern is ascribed to the Carletonville Dolomite Grassland (SANBI 2018), the importance of preserving these representative grassland habitat on a local scale, and particularly as part of the Crocodile River Reserve, is crucial.

The floristic patterns from the study site strongly correspond with the regional ecological type, i.e. Carletonville Dolomite Grassland, with some elements of the nearby Egoli Granite Grassland. Morphologically, the site is situated on a midslope with a slight northern slope. Prominent and significant outcropping of subsurface dolomites dissects the landscape, which is typical and characteristic of dolomitic grassland. Low rocky outcrops were noted immediately south of the site, consisting of dolomite boulders (although not accurately captured by the GDARD ridges information source). Soils that predominate within the site and surrounds are typically shallow and dark, with a high humic content.

While no noteworthy floristic variations are noted within the site itself, minor variations are noted in the wider region (<300 m), including deteriorated grassland to the west, localised rocky outcrops to the immediate south, and ephemeral drainage lines and associated grasslands to the north of the site. The vegetation of the site conforms primarily to a prominent and dense grassland that is co-dominated by several 'bunch' type grass species. Scattered and interspersed small trees and shrubs occur at low densities, and tends to densify and merge with surrounding grassland in areas of localised habitat deterioration, exposed rocky outcrops as well as in the lower lying, sheltered and warmer parts of the landscape towards drainage lines. Although the presence of several woody individuals is noted, which sporadically becomes locally dominant, the vegetation of the site and immediate surrounds is not considered a transitional type between grassland and savanna, but rather correspond to a pure grassland type.

The dynamics of this grassland type is not only strongly driven by seasonal changes and rainfall events, but structural and compositional attributes are particularly dependent on the frequency and intensity of fire. Observations from the immediate surrounds where vegetation was not affected by recent fires, indicate a highly moribund status. The absence of frequent fire events and a dedicated utilisation programme (grazing) often results in a moribund grass layer, which is invariably detrimental to herbaceous diversity. A brief review of historic aerial images from Google Earth indicates the last significant fire event occurred in 2019, and although only approximately 3 years ago, a significant difference in species richness is evident between moribund areas and parts where the dominant grass layer has been removed by recent fire, which allowed the herbaceous layer to sprout and flower. A high diversity of semi-woody dwarf shrubs, geophytes, herbs, succulents, and forbs have been recorded from these parts, which was not prevalent in nearby grassland types that were protected from the porific event and where the graminoid component remained moribund.

The grass layer of the site comprises the abundant and co-dominant 'bunch' type species *Brachiaria serrata*, *Cymbopogon caesius*, *Elionurus muticus*, *Loudetia simplex*, *Schizachyrium sanguineum*, *Themeda triandra*, *Trachypogon spicatus*, *Tristachya leucothrix* and *Urelytrum agropyroides*, and to a lesser extent *Aristida* species, *Bewsia biflora*, *Eragrostis* species, *Heteropogon contortus*, *Hyparrhenia hirta* (attaining localised dominance), *Pogonarthria squarrosa* and *Setaria sphacelata*.

The herbaceous layer is diverse, reflecting a high correlation to the regional ecological type. While most of these herbaceous growth forms rarely becomes dominant, some species, such as the succulent *Aloe davyana*, and to a lesser extent, the geophytic species *Hypoxis hemerocallidea*, *H. obtusa*, *Ledebouria marginata*, and *L. revoluta* were recorded abundantly across the site. Other conspicuous and abundant forb species include *Acalypha angustata*, *Jamesbrittenia burkeana*, *Lasiosiphon capitatus*, *Melolobium subspicatum*, *Albuca setosa*, *Boophone disticha*, *Drimia elata*, *D. multisetosa*, *Afroaster serrulatus*, *Chascanum pinnatifidum*, *Dolichos angustifolius*, *Heliotropium ciliatum*, *Hillardella eleagnoides*, *Ipomoea bolusiana*, *I. bathycolpos*, *Ocimum obovatum*, *Cucumis zeyheri*, *Hermannia depressa*, and *Scabiosa columbaria*.

Observations from nearby grassland areas to the immediate west of the site indicate a moderate level of habitat deterioration, characterised by significant changes to the species composition, structure and dominance, translating into lower ecological integrity and sensitivity. Notably, most of the climax grass species and a large proportion of the typical herb species have disappeared from these areas, that are currently characterised by a depauperate species composition. The absence of typical and 'normal' weeds, non-indigenous, and invasive plant species are noted from the proposed development footprint, contributing further to the pristine nature of the floristic environment.

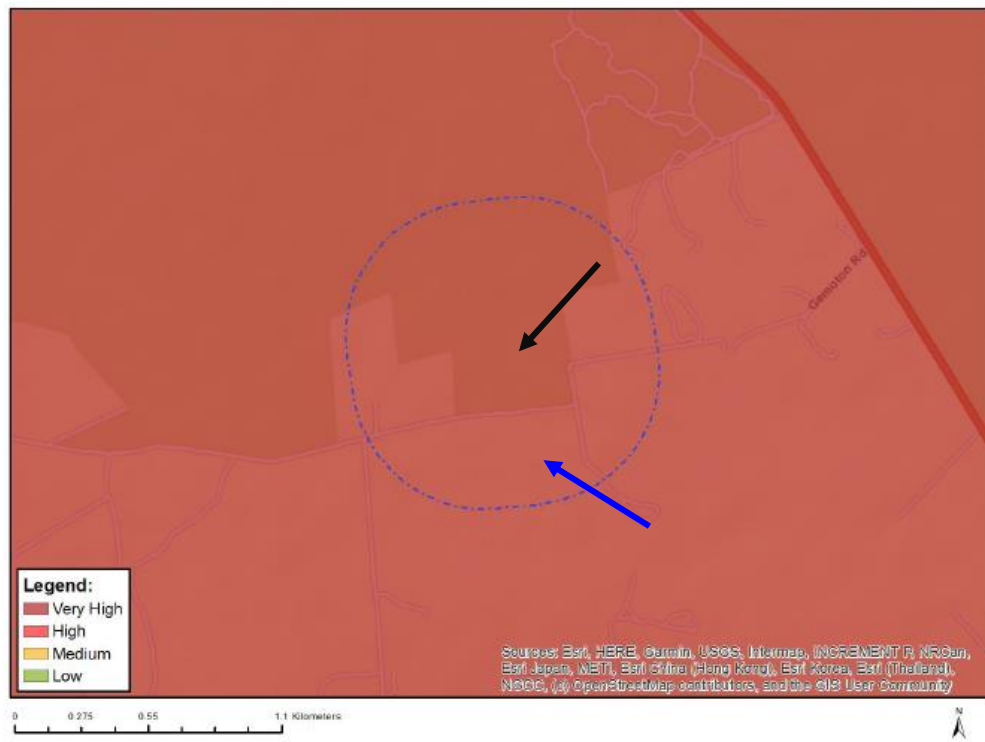


Figure 20: Terrestrial biodiversity sensitivity theme (Environmental Screening Report, 2022/06/10)

Black arrow indicates approximate location of the principal site, blue arrow indicates approximate location of the alternative site

It is evident from **Figure 18** that the original (alternative) site is situated in areas that are ascribed a Very High sensitivity, which probably relates to the presence of pristine and natural habitat, also correlating to the regional ecological type as well as the presence of conservation important plant species. In contrast, habitat from the preferred site is ascribed a High sensitivity, which correlates to findings from the site inspections. Habitat from these areas is considered slightly perturbed and of lower importance/ sensitivity than the original (alternative) site.

Survey conditions were considered to be optimal, and site inspections were conducted during seasonal periods that coincided with the flowering period of most plant taxa that could reasonably be expected to occur in the region. GDARD requires a 200 m buffer around species of conservation importance, which overlaps with the principal site and thus elevating the sensitivity of this site (refer Figure 15). The alternative site is situated outside the required buffer and is unlikely to affect any protected plant species directly.

No protected tree species (National Forest Act, 1998) were recorded from the site, or is considered likely to persist on the site, or immediate surrounds.

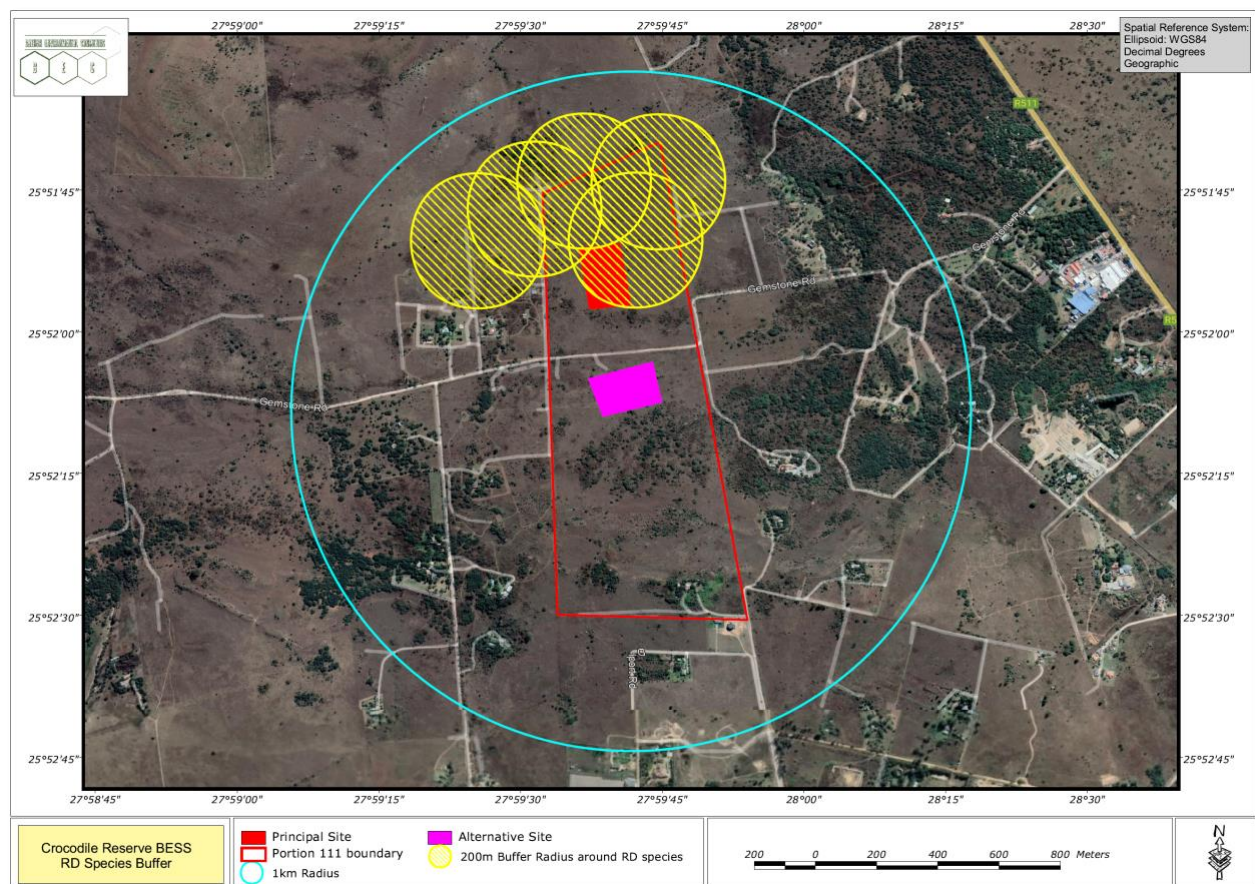


Figure 21: Red Data locations and required GDARD buffers

5.3.5. Fauna and avifauna

According to the presence of suitable habitat and the extant (or known) distribution ranges of mammal taxa in the study area (sensu MammalMap), the expected mammal richness on the study site and immediate surroundings is approximately 103 species (refer Table 7). It should be noted that the proposed site is situated within the Crocodile River Nature Reserve and the mammal richness is heavily influenced by the prevalence of mammal species which, although historically persisting in the region, might not necessarily be prevalent from surrounding urban areas if not for the management approach and conservation efforts associated with the nature reserve. It is furthermore likely that some of these animals, notably the larger mammal species, such as most of the larger antelope species (Bovidae), African Bush Elephant, larger predators (Felidae, Canidae), etc., represent animals that were reintroduced to the area as part of the conservation efforts.

Of the 103 expected species, 21 mammal species (c. 24.3 % of the total number of expected species) exhibit a high or moderate-high probability to occur within the proposed footprint sites. A total of 34 species (c. 33.0 %) exhibit moderate or moderate-low probabilities of occurrence, while 44 species (c. 42.7 %) are not considered likely inhabitants of the site and immediate surrounds. Some species that exhibit low probabilities either share distribution ranges peripheral to the study area or ecological information on their life histories and taxonomy are scant, thereby rendering their presence on the site as uncertain or questionable, even though suitable habitat might theoretically be present.

A total of only 7 mammal species were confirmed during the site visit, which represent only 28.0 % of the anticipated richness of mammal species (with a high or moderate-high probability to occur). This low diversity is heavily influenced by the short survey period as well as the small size of the study site. No mammal species included in threatened conservation categories were recorded during the site inspection period

The following key observations were made:

- ☐ Regional mammal richness is considered high, which is best explained by the site being sympatric to the Crocodile River Nature Reserve.
- ☐ The comparative small size of the study area negates the likelihood of a high mammal diversity persisting on the site on a permanent basis.
- ☐ However, the natural and pristine nature of habitat from the site (refer Botanical Section) implies that habitat from the site and immediate surrounds is considered suitable for a wide variety of mammal species, notably also including some conservation important mammal species. The presence of these mammal species within the study area is however likely to be highly erratic and opportunistic, as much of the surrounding areas reflects similar habitat types and status.

- ❑ No threatened mammal species were observed during the study period, or is considered likely to occur within the site for prolonged periods. The opportunistic presence can however not be discounted, and the possible presence is likely to be a result of migratory purposes.
- ❑ None of the threatened or near-threatened mammal species that have previously been recorded from the wider region are considered likely to persist within the study area on a permanent basis. Habitat within the study area is homogenous and considered ubiquitous on a local scale.
- ❑ A high ecological connectivity of habitat types correlating to the regional ecological types is noted, which naturally will lead to an elevated conservation status and sensitivity.
- ❑ Both the principal and alternative site exhibit similar sensitivities to the mammalian receiving environment. Based on the slightly deteriorated state of the alternative site, it is recommended that the development be located on the alternative site.

Data inferred from the South African Bird Atlas Project (SABAP2; www.sabap2.birdmap.africa) for the pentad 2550_2755 indicates a total of 225 full pentad cards between 2008 and 2022, with a collective total of 299 bird species (refer Table 12). This diversity equates to 30.5 % of the approximate 9793 species listed for the southern African subregion⁴ (and approximately 35.0 % of the 855 species recorded within South Africa⁵). A brief review of available data indicates that 51 species (c. 17.1 %) have record frequencies in excess of 50 % from the 225 full protocol cards, many of these species are typically associated with the grassland ecoregion. A total of 14 species (c. 4.7 %) have record frequencies in excess of 75 % from the total of 225 full protocol cards, most of these species are typically associated with a wide variety of habitat types and have wide distribution ranges. These include:

- ❑ Spurfowl, Swainson's (*Pternistis swainsonii*);
- ❑ Duck, Yellow-billed (*Anas undulata*);
- ❑ Goose, Egyptian (*Alopochen aegyptiaca*);
- ❑ Bishop, Southern Red (*Euplectes orix*);
- ❑ Dove, Red-eyed (*Streptopelia semitorquata*);
- ❑ Lapwing, Blacksmith (*Vanellus armatus*);
- ❑ Fiscal, Southern (*Lanius collaris*);
- ❑ Guineafowl, Helmeted (*Numida meleagris*);
- ❑ Stonechat, African (*Saxicola torquatus*);
- ❑ Prinia, Tawny-flanked (*Prinia subflava*);
- ❑ Ibis, Hadada (*Bostrychia hagedash*);

³ *sensu* www.zestforbirds.co.za (Hardaker, 2019).

⁴ A geographical area south of the Cunene and Zambezi Rivers (includes Namibia, Botswana, Zimbabwe, southern Mozambique, South Africa, Swaziland and Lesotho).

⁵ With reference to South Africa (including Lesotho and Swaziland) (BirdLife South Africa, 2018).

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

- ❑ Bulbul, Dark-capped (*Pycnonotus tricolor*);
- ❑ Crow, Pied (*Corvus albus*); and
- ❑ Weaver, Southern Masked (*Ploceus velatus*).

A total of 58 species (c. 19.4 %) have record frequencies lower than 1 % of the 225 full protocol cards. The highest number obtained was 125 (2022) and the lowest 6 species (2016).

A total of 44 species have been recorded during the brief survey period (refer Table 12, indicated in bold), which equates to 14.7 % of the regional observation records and is lower than the mean of 62 species recorded from the 225 full protocol cards between 2008 and 2022. The comparative low number of recorded species from the site is best explained by the small size of the study area as well as the homogenous grassland nature and absence of significant habitat heterogeneity, such as significant outcrops, hills, ridges and mountains as well as wetlands, rivers, dams, and ephemeral grassland types.

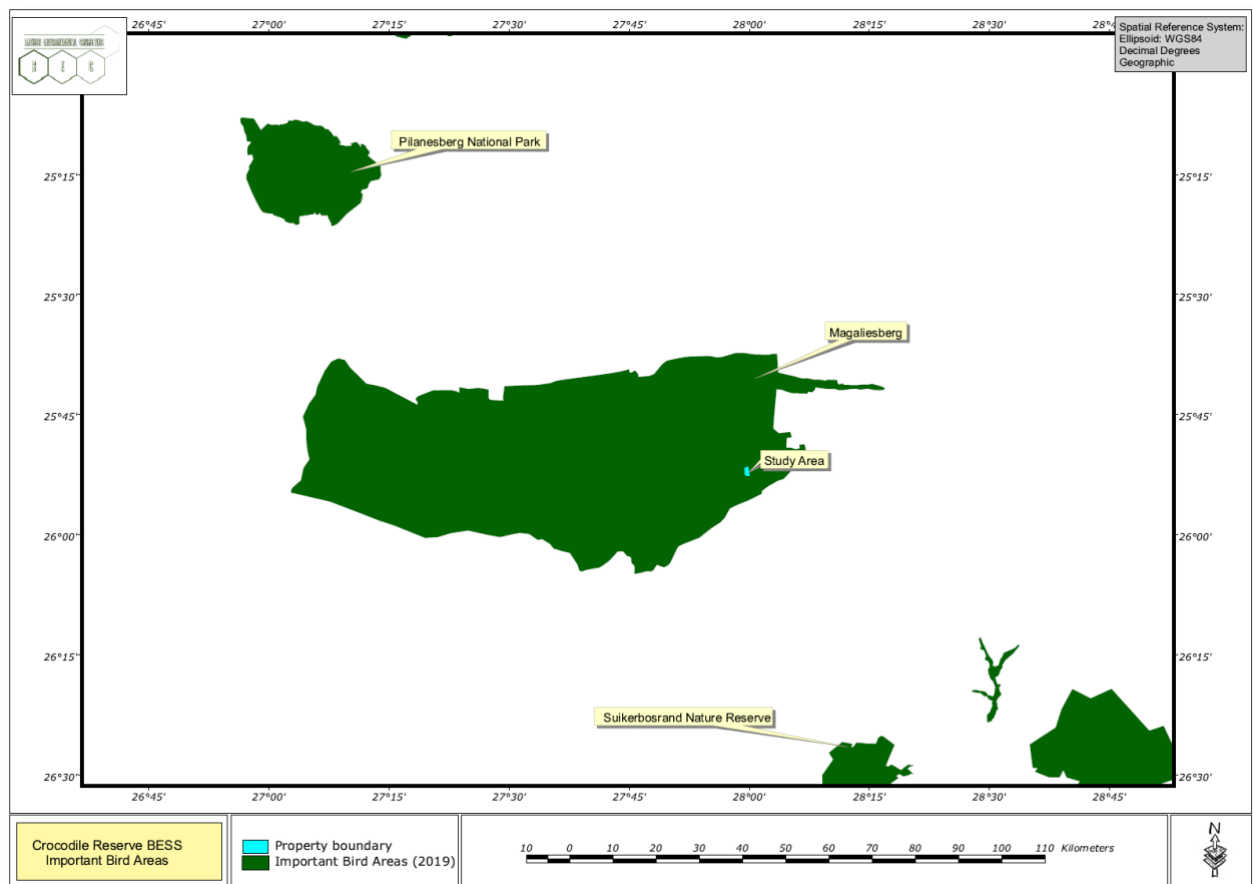


Figure 22: Important Bird Areas in relation to the study area

5.4. Cultural aspect

5.4.1. Heritage

The study area is located within the Crocodile Reserve, which falls within the buffer zone of the Magaliesberg Biosphere as declared by the United Nations Educational, Scientific and Cultural Organization (UNESCO). Recognised for its exceptional natural, cultural, and human characteristics. Magaliesberg Biosphere lies at the interface of two key African biomes – the central grassland plateaux and the sub-Saharan savanna – with remnants of a third, Afromontane Forest. The landscape provides habitat to diverse fauna and flora. The study area is an open area within the reserve. According to historical maps, it has not been developed in the past, with limited infrastructure development in the surrounding area from the 1980s onwards.

5.4.2. Palaeontology

The palaeontological sensitivity of the area under consideration is presented in the figure below, with the Monte Christo and Oaktree Formations of the Malmani Subgroup indicated as very highly sensitive (red) because of the potential of finding trace fossils, in particular stromatolites. Stromatolites are the trace fossils that were formed by colonies of green algae and blue-green algae (Cyanobacteria) that grew in warm, shallow marine settings. These algae were responsible for releasing oxygen via the photosynthetic process where atmospheric carbon dioxide and water, using energy from the sun, are converted into carbon chains and compounds that are the building blocks of all living organisms. The released carbon dioxide was initially taken up by the abundant reducing minerals to form oxides, e.g., iron oxide. Eventually, free oxygen was released into the atmosphere, and some were converted into ozone by the bombardment of cosmic rays. The ozone is critical for the filtering out of harmful ultraviolet rays.

Stromatolites are the layers upon layers of inorganic materials that were deposited during photosynthesis, namely calcium carbonate, magnesium carbonate, calcium sulphate and magnesium sulphate. These layers can be in the form of flat layers, domes or columns depending on the environment where they grew (Beukes, 1987). Some environments did not form stromatolites, just layers of limestone that later was converted to dolomite. The algae that formed the stromatolites are very rarely preserved, and they are microscopic so they can only be seen from thin sections studies under a petrographic microscope.

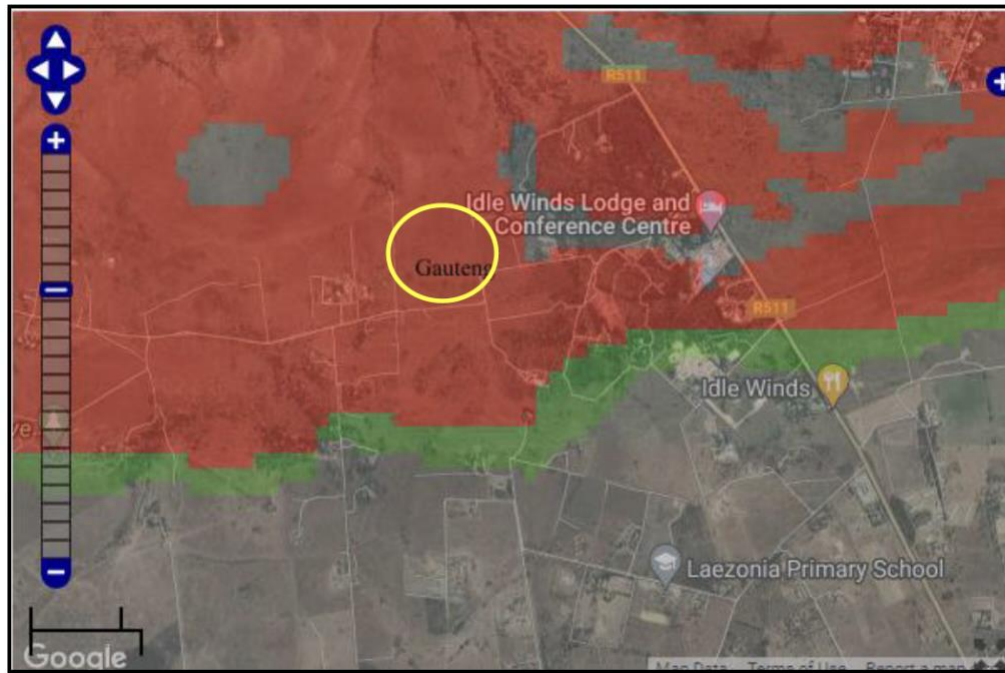


Figure 23: Palaeontological map of the project site

5.5. Noise

A worst-case controlled scenario was used to help identify potential issues, identify the significance rating and potential noise impacts in terms of legislation. The Sound Power Levels (SPL) were selected based on the noise levels. Typical construction site noise without obstacles emits approximately 101 dBA of continuous time integrated sound pressure from construction activities. The table below indicates the noise reduction due to the distance from the noise sensitive receptors to the proposed sites.

Table 6: Prediction of the Construction Noise at the closest noise sensitive receptors

Site	Approximate Noise Level at 1m from Construction Source	Predicted Noise level at Closest Noise Sensitive Receptor	Measured Baseline Noise Levels (Day / Night) dBA	Exceedance of Noise Level between the Baseline Noise Levels and Predicted Noise Levels (Day / Night) dB
Proposed Alternative Site	101 dB	51.2 dBA (NR 2)	43.1 / 36.0	+8.1 / +15.2

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

The continuous typical construction site noise will exceed the baseline noise measurements by 8.1 dB during the daytime and 15.2 dB during the night-time periods. This means that construction activities will be audible during the day and night-time periods and will be considered a noise disturbance. The construction phase is temporary and typically completed within one year. As there is no detailed design or complete specification of the proposed BESS Facility, the following main noise generating activities were considered for a modelled investigated scenario(s):

- ❑ Area noise source at a noise level of 80 dBA for the Container area which includes Inverter and Battery Containers. This is considered the worst-case scenario.

Simulated noise levels of the proposed Project's operational phase are illustrated in the figure below in relation to sensitive receptors. The table below shows the potential noise levels that may be experienced at the three closest noise sensitive sites in conjunction with current operational noise.

Table 7: Simulation of the existing noise levels from the Proposed Alternative Site

Receiver	Measured Baseline Noise Levels (Day / Night) dBA	Predicted Operational Noise Levels LReq (dBA)	Predicted Daytime Excess Ambient Noise Levels (Δ L Req, d) (dBA)	Predicted Night- time Excess Ambient Noise Levels (Δ L Req, n) (dBA)
NR1	43.1 / 36.0	42	0	6
NR2	43.1 / 36.0	40	0	4
NR3	43.1 / 36.0	38	0	2
NR4	43.1 / 36.0	39	0	3
NR5	43.1 / 36.0	35	0	0
NR6	43.1 / 36.0	<35	0	0
NR7	43.1 / 36.0	<35	0	0
NR8	43.1 / 36.0	39	0	3
NR9	43.1 / 36.0	35	0	0
NR10	43.1 / 36.0	<35	0	0

The operational noise levels at the proposed alternative site do not exceed the existing baseline noise levels during daytime period. The operational noise levels at the proposed alternative site exceeds the existing baseline noise levels during night-time period by between 2 and 6 dB.

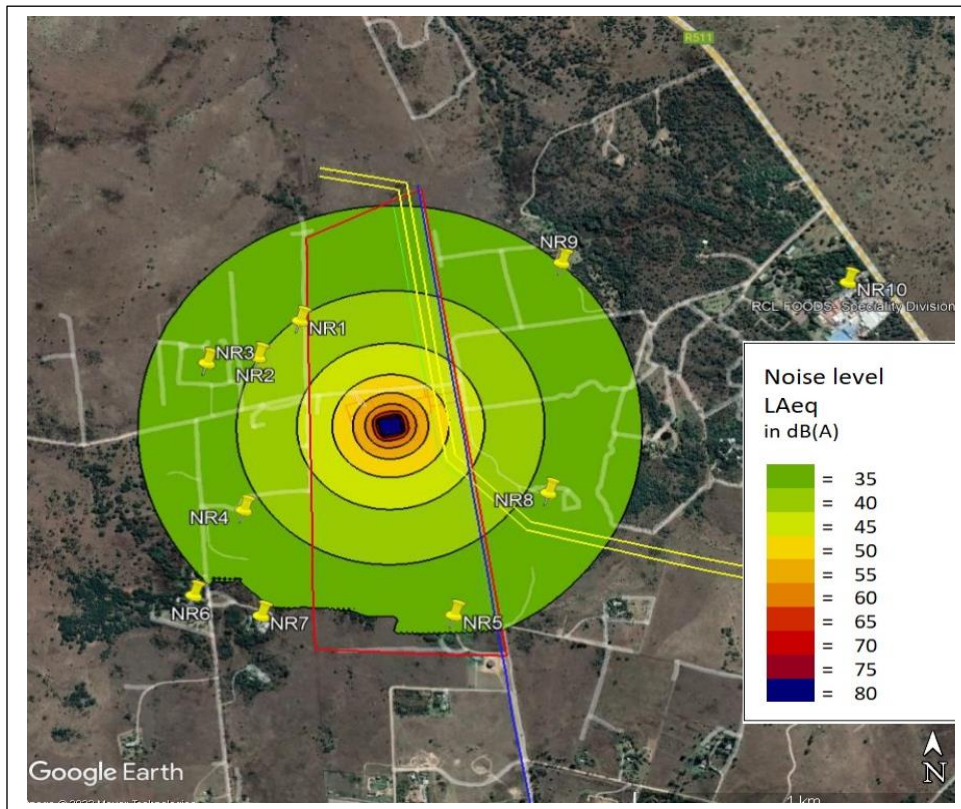


Figure 24: Simulation of the noise levels from the preferred site

5.6. Social aspect

5.6.1. Population

The proposed project is in the southwestern portion of region 4 of the City of Tshwane Metropolitan, Gauteng Province (refer to the figure below) The region borders on the area of jurisdiction of the City of Johannesburg Metropolitan Municipality, Ekurhuleni Metropolitan Municipality as well as Mogale City to the west. The region is one of the more affluent areas. It incorporates Centurion and Irene in the east, Olievenhoutbosch in the south and the Rhens Nature Reserve in the west with an extent of 489 km² and comprising of 11 wards.

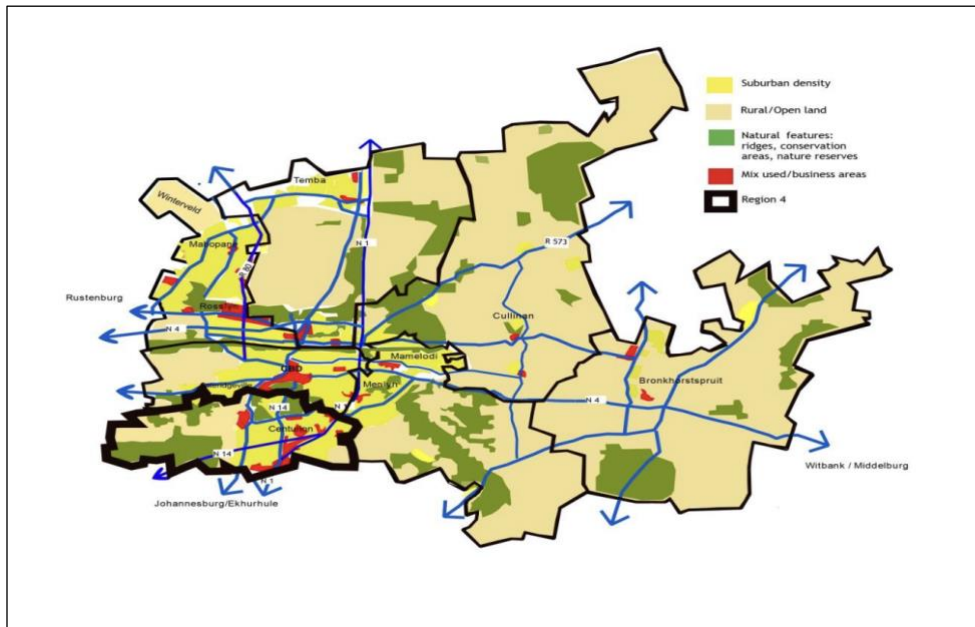


Figure 25: Region 4 locality map

Its strategic location along the border of Johannesburg has resulted in its development progress further towards the south, with many investors attracted by local developments. Other important areas include the Zwartkop and Waterkloof military airports, the Centurion CBD, the Sunderland Ridge industrial area, the N1 corridor, the Louwlandia commercial and industrial area and Samrand.

5.6.2. Demographics

Region 4 has a population of about 379 349 which is approximately 13% of the total population of Tshwane (2 921 488) (StatsSA, 2011). This is an increase from the 354 918 recorded by the 2008 Tshwane Household Survey. Approximately 68.6% of the population are economically viable, whereas 31.4% are non-active. According to the Tshwane Household Survey, the region has 11.9% self-employed people between the ages of 15 and 64, with men making up 66.8% and women 33.2%. In terms of income groups, 25 % of the population can be regarded as within the low-income group (monthly household income of less than R2 000 a month) refer to the figure below.

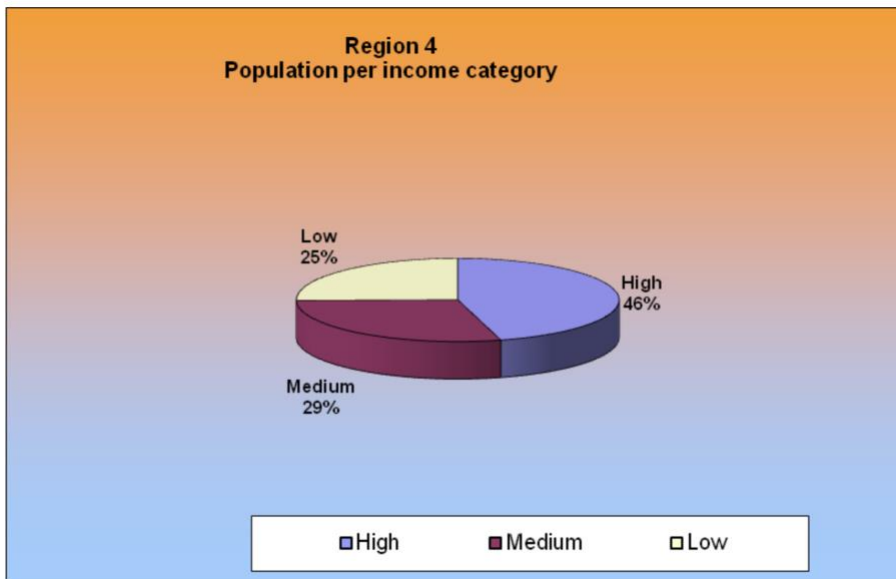


Figure 26: Region 4 locality map

5.6.3. Education

The education level in this region is relatively high compared to other regions, with higher number of people with a tertiary education. The relatively high education level may benefit growth figures as a young and educate populace can enter the economy and drive further economic growth.

The above chart indicates how the educational profile of the population that is 20 years or older in Region 4 has changed over the 1997 – 2019 period. As indicated in the figure, the percentage share of the people (20 years +) in Region 4 with no schooling has decreased from 3.82 percent in 1997 to 1.51 percent in 2019, whilst the percentage of people just matric have decreased from 37.4 percent in 2013 to 34.60 percent in 2019. The percentage share of people (20 years +) in Region 4 with certificates or a diploma without matric has declined from 3.28 percent in 1997 to 0.69 percent in 2019. Efforts should however focus on moving Grade 12 learners into further educating themselves to be able to participate in the region's economic opportunities. In summary, in Region 4:

- ❑ 2% of adults have no schooling; and
- ❑ 24% of adults are schooled up to grade 12.

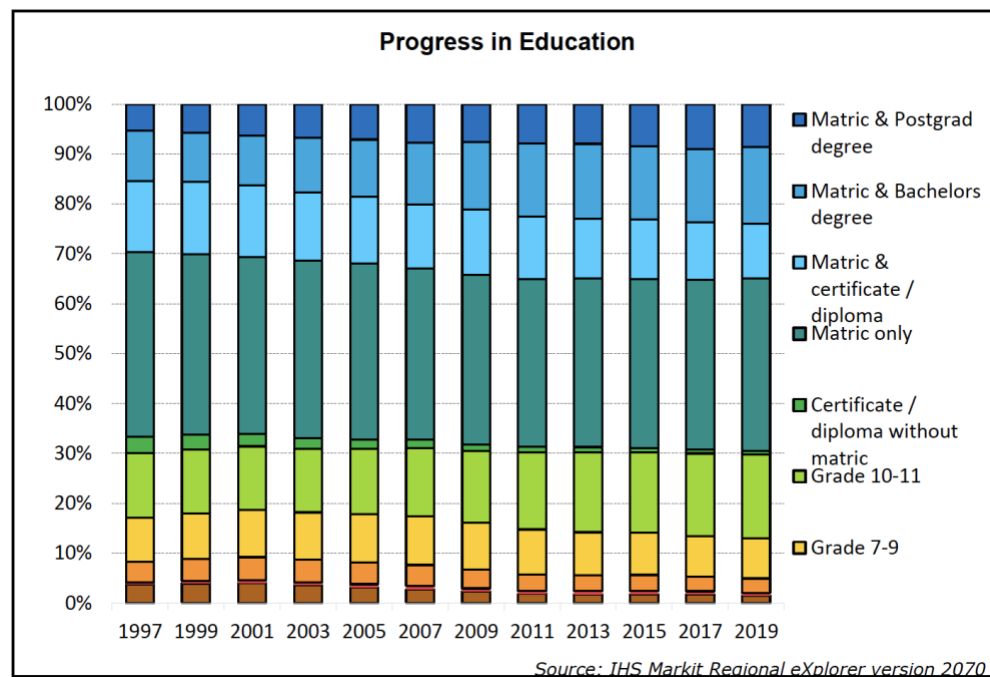


Figure 27: Educational profile for Region 4

5.6.4. Economic Base

The City of Tshwane is the fourth biggest municipality in South Africa and the second biggest in Gauteng in terms of gross value added by region, with a gross value add of R497 billion. In 2019, the City of Tshwane contributed 28.4 percent to the provincial economy. Moreover, Tshwane accounted for 9.79 percent of the country's economy.

Region 4 forms part of an area of economic expansion to the north of Johannesburg. This sub-node is dominated by smart industries and business tourism. There is a prospect for future expansion of a smart industry/knowledge regional sub-node that could be used in strengthening the Gauteng Province's comparative advantage as a "smart province". The information below indicate that the region's local economy is based on certain dominating economic sectors:

- ☐ Finance and Business Service Sector (26.7%)
- ☐ General Government Services (22.7%)
- ☐ Manufacturing Sector (18.1%)
- ☐ Trade Sector (14%)

These sectors represent the pillars of the local economy includes:

- ☐ Centurion Mall;
- ☐ The Reeds;

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

- ☐ Lifestyle Mall;
- ☐ Lyttelton complex;
- ☐ The economic sectors that increased their share within the local economy between 1998 and 2004 include Finance and Business Services (24.0% to 26.7);
- ☐ Transport and communication (5.1% to 7.6%) include warehousing and distribution;
- ☐ Trade sector (12.6% to 14.0%) and
- ☐ Construction sector (2.4% to 2.8%).

5.6.5. Unemployment

In 2019, there were a total number of 439 000 people unemployed in the City of Tshwane, which is an increase of 167 000 from 272 000 in 2009. The total number of unemployed people within City of Tshwane constitutes 20.63% of the total number of unemployed people in Gauteng Province. The City of Tshwane Metropolitan Municipality experienced an average annual increase of 4.89% in the number of unemployed people, which is worse than that of the Gauteng Province, which had an average annual increase in unemployment of 4.63%. In 2019, the unemployment rate in City of Tshwane Metropolitan Municipality (based on the official definition of unemployment) was 26.48%, which is an increase of 5.4 percentage points. The unemployment rate in City of Tshwane Metropolitan Municipality is lower than that of Gauteng. The unemployment rate for South Africa was 28.37% in 2019, which is an increase of -4.06 percentage points from 24.31% in 2009 (refer to the figure below).

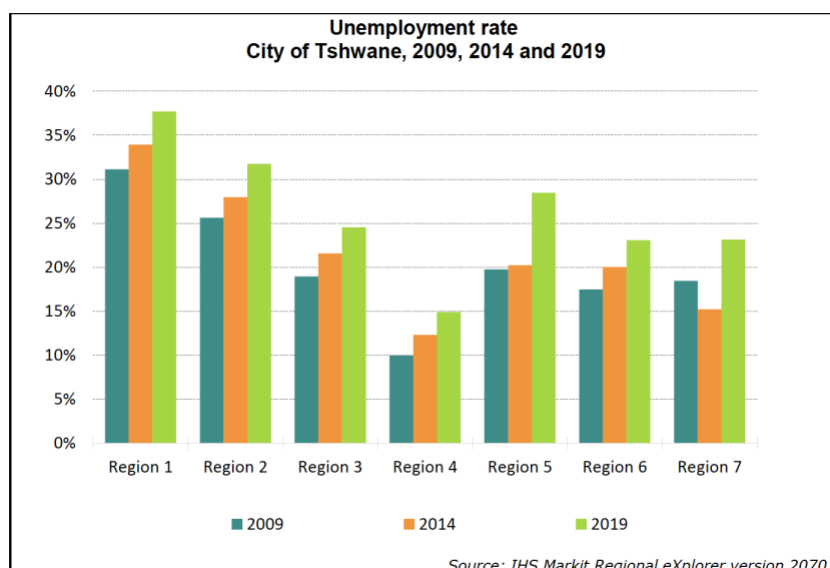


Figure 28: Unemployment rate per region within the City of Tshwane

CHAPTER 6: PROJECT'S IMPACT ASSESSMENT

To obtain a credible assessment of environmental impacts, the assignment of 'impact significance' to each identified impact needs to be a robust, consistent and transparent process. The methodology to assess 'impact significance' is outlined below in accordance with the 2014 EIA regulations (as amended) and the IFC Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets based on the assumption that the significance of an impact on resources or receptors is considered to result from an interaction between three factors:

- ☐ The nature and magnitude of the impact (i.e. a change in the environment, social and/or health baseline conditions);
- ☐ The number of resources or receptors affected (i.e. humans and the environment); and
- ☐ The environmental value or sensitivity of those resources or receptors to the change.

A three-phase approach has been used to determine the significance of environmental and social impacts, as follows:

- ☐ Phase 1 – Evaluation of value/sensitivity of resource or receptor;
- ☐ Phase 2 – Assessing the magnitude of the impact on the resource or receptor; and
- ☐ Phase 3 – Determining the significance of impacts

Identification and Evaluation of Sensitive receptors are defined as:

- ☐ Elements of the environment that are of value to the functioning of natural systems (i.e. areas or elements of ecological, landscape or heritage value, species, habitats and ecosystems, soil, air and water bodies or land-use patterns); and
- ☐ Human receptors, such as stakeholders (i.e. users of dwellings, places of recreation, places of employment, community facilities or household relocation) and human systems (e.g. employment market, population disease susceptibility and disease communicability, exposure to toxicity of chemicals).

The environmental sensitivity of the environmental and social value of the resource or receptor has been defined using the criteria in the table below.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

Table 8: Environmental/social sensitivity

SENSITIVITY VALUE	DESCRIPTION OF THE VALUE
High	<ul style="list-style-type: none"> • High importance and rarity on a national scale, and limited potential for substitution. • The receptor is close to reaching its carrying capacity, so a further impact may lead to a significant damage to the system that it supports. • Locations or communities that are particularly vulnerable to the environmental impact under consideration (e.g. residential areas, vulnerable/marginalized groups).
Medium	<ul style="list-style-type: none"> • High or medium importance and rarity on a regional scale, limited potential for substitution. • The receptor is already significantly impacted, but it is not close to reaching its carrying capacity. Further impacts will get increase the stress of the underlying system, but evidence does not suggest that it is about to reach a critical point. • Locations or groups that are relatively vulnerable to the environmental impact under consideration (e.g. commercial areas).
Low	<ul style="list-style-type: none"> • Low or medium importance and rarity on a local scale. • The receptor is not significantly impacted and shows a large spare carrying capacity. Impacts are not likely to generate any noticeable stress in the underlying system. • Locations or groups that show a low vulnerability to the environmental impact under consideration (e.g. industrial areas).
Very Low	<ul style="list-style-type: none"> • Very low importance and rarity on a local scale. • The receptor is not impacted and shows a very large spare carrying capacity. Impacts are very unlikely to generate any noticeable stress in the underlying system. • Locations or groups that show a very low vulnerability to the environmental impact under consideration (e.g. industrial areas).

The existence of legally protected receptors (e.g. designated areas, protected habitats or species) will be considered for the assessment of the sensitivity of the receptors.

6.1. Identification and evaluation of potential impacts

The following types of impacts have been considered in line with Dzimuzwo Consulting's assessment methodology:

- ☐ Direct Impacts - Potential impacts that may result from the construction and occupation of the Project acting directly on an environmental or social receptor (e.g. land taken for construction of the camps);

- ❑ Indirect Impacts – Potential impacts which are not a direct result of a Project activity, often produced later in time or further removed in the distance, but are usually a result of a complex pathway (e.g. dust deposition on vegetation which causes a reduction in photosynthetic rates);
- ❑ Beneficial Impacts – Impacts that have a positive, desirable or favourable impact on the sensitive resources or receptors (e.g. landscape providing artificial habitat for a variety of species, creating jobs during the construction and/or occupation phases of a project);
- ❑ Adverse Impacts – Impacts that are detrimental and have a negative influence on sensitive resources or receptors;
- ❑ Event Related Impacts - Potential unplanned or accidental impacts stemming from an unintentional event such as fire, explosion, oil spill, etc., taking into consideration the likelihood of occurrence;
- ❑ Cumulative Impacts - The additive potential impacts that may result from the incremental potential impacts of the planned Project plus the potential impacts of reasonably anticipated future projects or phases of the same development.

6.2. Determination of significance of impacts

The significance of impacts is determined by taking into consideration the sensitivity of an identified receptor or resource and the magnitude of the Project impact. That is, the greater the environmental sensitivity of an identified receptor or resource, and the greater the magnitude of impact, the more significant the impact (project impact).

In addition to this, where a Project has a major detrimental impact on a highly valued environmental resource/receptor, the consequences of that impact on the said resource would be significantly adverse. In other words, it is the result of the impact acting on the receptor that produces an environmental impact.

Impacts can be either beneficial or adverse. The table below shows the criterion used for determining the significance of environmental impacts. Definitions of each significance category are provided in the table below.

Table 9: Definition of impact significance

SIGNIFICANCE CATEGORY	CRITERIA
Very large	<ul style="list-style-type: none"> • Only adverse impacts are assigned this level of importance as they represent key factors in the decision-making process. Impacts are associated with sites and features of national or regional importance. • Impacts exceed statutory limits. • Mitigation measures are unlikely to remove such impacts.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

Large	<ul style="list-style-type: none"> Important considerations at a local scale but, if adverse, are potential concerns to the project and may become key factors in the decision-making process. Mitigation measures and detailed design work are unlikely to remove all of the impacts upon the affected communities or interests.
Moderate	<ul style="list-style-type: none"> These impacts, if adverse, while important at a local scale, are not likely to be key decision-making issues. Nevertheless, the cumulative impact of such issues may lead to an increase in the overall impacts on a particular area or on a particular resource. They represent issues where impacts will be experienced but mitigation measures and detailed design work may ameliorate or enhance some of the consequences upon affected communities or interests. Some residual impacts will still arise.
Slight	<ul style="list-style-type: none"> Local issue unlikely to be of importance in the decision-making process. Impacts do not exceed statutory limits. Nevertheless, they are of relevance in enhancing the subsequent design of the project and consideration of mitigation or compensation measures.
Neutral	<ul style="list-style-type: none"> No impact or impact that is beneath the level of perception, within normal bounds of variation or within the margin of forecasting error. No mitigation is required.

In some cases, the significance of the impact is shown as one of two alternatives. In these cases, a single description is decided upon with reasoned judgement for that level of significance chosen. The approach to assigning significance of impact relies on reasoned argument, professional judgement and taking on board the advice and views of appropriate organisations. For some disciplines, it is determined by comparison, wherever possible, with the company, locally, nationally or internationally accepted standards. If no standards are available then it is necessary to develop Project specific limits based on guidance or best practice as necessary. Such standards or limits are referred to as the Significance Threshold. If the size and type of impact are greater than the significance threshold, then this is termed a Significant Impact. Potential significant impacts need to be avoided and are therefore prioritised identifying mitigation measures to reduce the impact to an acceptable level.

Table 10: Criteria for determining significance of impacts

		MAGNITUDE OF IMPACT (DEGREE OF CHANGE)				
		NO CHANGE	NEGLIGIBLE	MINOR	MODERATE	MAJOR
SENSITIVITY OF	VERY HIGH	Neutral	Minor	Moderate to Major	Major	Major

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

	HIGH	Neutral	Minor	Minor to moderate	Moderate to Major	Major
	MEDIUM	Neutral	Negligible to minor	Minor	Moderate	Moderate to Major
	LOW	Neutral	Negligible to minor	Negligible to minor	Minor	Minor to moderate
	VERY LOW	Neutral	Negligible	Negligible to minor	Minor	Minor

The magnitude of the impact refers to the extent of change that is anticipated to occur for the receptor(s) under consideration and is considered as a function of:

- ☐ Extent/scale;
- ☐ Duration;
- ☐ Frequency; and
- ☐ Likelihood of occurrence

In other words, the criterion that has been used for assessing the magnitude of impacts includes the geographical scale of the impact, the permanence of impact and the reversibility of the impacted condition. A brief description of the magnitude of the impacts is provided in the Table below.

Table 11: Criteria for magnitude of impacts

MAGNITUDE OF IMPACT	DESCRIPTION OF MAGNITUDE
Major	<ul style="list-style-type: none"> • Adverse: Loss of resource and/or quality and integrity; severe damage to key characteristics, features or elements. A major impact is usually large-scale, permanent and irreversible. • Beneficial: Large scale or a major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality.
Moderate	<ul style="list-style-type: none"> • Adverse: Significant impact on the resource, but not adversely affecting the integrity; Partial loss of/damage to key characteristics, features or elements.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

	<p>Moderate impacts usually extend above the site boundary, and are usually permanent, irreversible or cumulative.</p> <ul style="list-style-type: none"> • Beneficial: Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.
Minor	<ul style="list-style-type: none"> • Adverse: Some measurable change in attributes quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements. Minor impacts usually are only noticeable within the site and are temporary and reversible. • Beneficial: Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring.
Negligible	<ul style="list-style-type: none"> • Adverse: Very minor loss or detrimental alteration to one or more characteristics, features or elements. • Beneficial: Very minor benefit to or positive addition of one or more characteristics, features or elements.
No change	<ul style="list-style-type: none"> • No loss or alteration of characteristics, features or elements; no observable impact in either direction.

6.3. Biodiversity

6.3.1 Direct Impacts

Direct impacts include those that may result from the construction and occupation of the site and that affect environmental or social receptors directly (e.g. land taken for construction of the camps). The largest extent of impacts within the terrestrial biodiversity environment is likely to stem from direct (physical) effects of land clearing activities and associated habitat losses. Typically, activities that involve the complete removal of existing vegetation/ habitat from the footprint are locally destructive and devastating, similarly to the direct impacts on animal species that cannot vacate a site (sessile). Impacts of a direct nature, therefore, include the variety of effects on natural habitat types, locally endemic species, populations and species and populations of conservation importance, as well as habitat that is associated with these species. Also included are adverse impacts on overall floristic and faunal/ avian species richness, diversity, and abundance. These impacts also frequently include effects on genetic variability, population dynamics, overall species existence or health. Lastly, losses of sensitive habitat, spatially restricted habitat types, and protected habitat types are also included in this category.

These impacts are generally measurable, quantifiable, and easy to identify, while effects are mostly predictable and immediately visible (after the fact) and can therefore be established or predicted with an acceptable level of certainty. It is notoriously difficult to prevent (apart from preventing the activity in its entirety by means of the “No-Go Option”) while predictions on future ecosystem changes are more problematic and variable. As the proposed development is comparatively small, the physical extent of these impacts is not considered particularly significant.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

Nature of Impact	Impacts on/ losses of conservation important and protected plant and animal species (individuals, stands, populations) including habitat associated with plants and animals of conservation importance	
	Before Mitigation	After Mitigation
Sensitivity Value	Medium	Low
Extent	Local (< 2km)	Site
Duration	Permanent	Long term (life of operation)
Probability	Possible	Unlikely
Magnitude	Moderate	Minor
Significance	Moderate	Negligible - Minor
Reversibility	Very Low	Low
Mitigation Potential	Medium	Medium
Mitigation Actions	Confirm absence of RD species by means of final walkthrough prior to site clearance, relocated any species that might be present to suitable nearby areas. Avoid peripheral impacts from development activities. Institute annual monitoring programme to establish long-term impacts, amend activities to ensure zero harm to environment	

Nature of Impact	Losses, and deterioration, of natural and sensitive habitat types, including essential habitat refugia for animals (breeding and foraging), atypical and unique/ restricted habitat types	
	Before Mitigation	After Mitigation
Sensitivity Value	Medium	Medium
Extent	Local (< 2km)	Site
Duration	Permanent	Long term (life of operation)
Probability	Definite	Possible
Magnitude	Moderate	Minor
Significance	Moderate	Minor
Reversibility	Low	Medium

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

Mitigation Potential	Medium	High
Mitigation Actions	Restrict development to perturbed areas of Alternative Site. Avoid personnel and vehicle movement in areas outside footprint, north of Gemstone Road, particularly rocky outcrops	
Nature of Impact	Depletion of local floristic and animal diversity and loss of rare plant and animal species or communities/ assemblages	
	Before Mitigation	After Mitigation
Sensitivity Value	High	Low
Extent	Local (< 2km)	Site
Duration	Long term (life of operation)	Short term (construction)
Probability	Possible	Unlikely
Magnitude	Minor	Negligible
Significance	Moderate - Minor	Negligible - Minor
Reversibility	Medium	High
Mitigation Potential	Medium	High
Mitigation Actions	Control personnel and vehicular movement outside development footprint. Restrict all construction activities to development footprint only. Avoid peripheral impacts in natural habitat outside development footprint. No harvesting, picking, destroying of any plants outside development footprint. No killing or capturing or disturbance of animals from site and surrounds.	

Discussion & Recommendations:

Direct impacts are considered the most significant and severe form of impact on a local scale. However, a significant reduction in impact significance on the alternative site is evident with impact significance generally ranging between moderate and negligible. While direct impacts could potentially have implications on sensitive botanical and faunal/ avian receptors beyond the development footprint, the application of an effective mitigation approach will prevent these impacts from occurring, or significantly reducing the magnitude and extent. The alternative site ultimately comprises a more deteriorated habitat where floristic sensitivity is considered suitably low to prevent any direct impacts of a significant nature on the terrestrial biodiversity environment.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

6.3.2 Indirect Impacts

Indirect impacts include those which are not a direct result of an activity, and which is often spatially and temporally removed from the activity, but are usually a result of complex pathways (e.g. dust deposition on vegetation which causes a reduction in photosynthetic rates) or high disturbance factors for animals that utilises habitat nearby development. Indirect impacts are not always immediately evident and can consequently not be measured at a specific moment in time. These 'spill-over effects' or 'edge effects' are spatially (realising outside the site perimeter) and temporally (occurring sometime after the actual impact, in future, ranging from immediate to several years) removed from the actual activity/ development footprint. Manifestations thereof are typically more subtle and not as locally devastating as direct impacts, but often at a scale exceeding the actual site where the activity is undertaken, although usually restricted to a local scale (< 2 km), rarely regional.

A measure of estimation, extrapolation, or interpretation and specialist knowledge is therefore required to evaluate the significance of indirect impacts and it is usually an integrated factor of the sensitivity of the receiving surrounding environment, correlated against the severity and realistic expectations (based on experience) of the development. Indirect impacts typically result in adverse effects or deterioration of the surrounding areas, with an effect that diminishes from the edge of the impact, which is determined by the specific vectors of transport. For example, considering the nature of rivers, some impacts (such as pollution) are 'carried' much further than others, impacts that are related to increased dust levels might adversely affect within a radius of approximately 2 km, contaminated water and alien and invasive species (seeds) that are carried by rivers might affect areas as far away as 20 km, or more. Notwithstanding the vector, in most cases it is the ecological functionality of the surrounding area that is adversely affected, as opposed to impacts on species level.

Nature of Impact	Deterioration and changes to untransformed habitat in the surrounds, with specific reference to sensitive habitat types and habitat types of limited representation on a local scale as well as animal species persisting within the immediate vicinity of the development	
	Before Mitigation	After Mitigation
Sensitivity Value	Medium	Low
Extent	Local (< 2km)	Site
Duration	Long term (life of operation)	Long term (life of operation)
Probability	Possible	Unlikely
Magnitude	Minor	Minor

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

Significance	Minor	Negligible - Minor
Reversibility	Medium	High
Mitigation Potential	Medium	Medium
Mitigation Actions	Control personnel and vehicular movement outside development footprint. Restrict all construction activities to development footprint only. Avoid peripheral impacts in natural habitat outside development footprint. Control operational activities to reduce disturbance level to surrounding animal species	

Nature of Impact	Exacerbated decline in the aesthetic (natural) appeal of the landscape	
	Before Mitigation	After Mitigation
Sensitivity Value	Medium	Medium
Extent	Local (< 2km)	Site
Duration	Permanent	Permanent
Probability	Possible	Unlikely
Magnitude	Moderate	Minor
Significance	Moderate	Negligible - Minor
Reversibility	Medium	Medium
Mitigation Potential	High	High
Mitigation Actions	Avoid peripheral impacts in adjacent natural habitat. Develop and implement rehabilitation and aesthetic practices to ensure natural landscaping around perimeter. Use locally indigenous species for landscaping. Ensure compliance with Crocodile River Nature Reserve Environmental Management Plan. Institute annual monitoring programme to ensure zero harm to environment.	

Aesthetic appeal of the region, although a personal and highly debatable attribute, is regarded a potential receiver of landscape changes, declining with continued transformation of natural land and addition of industrial landscapes and skylines, lights, infrastructure, etc.

Discussion & Recommendations:

Impacts of an indirect nature, although considered slightly lower in significance compared to direct impacts, is anticipated to cause deterioration and impacts on sensitive habitat beyond the

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

development footprint. Results from the assessment has indicated a high sensitivity of the wider region, including the likely presence of conservation important plant and animal species, and the likelihood of impacts on these receptors are likely to occur. The selection of the alternative site has reduced the significance of this impact considerably, while the parallel development and implementation of suitable landscaping and monitoring programmes and control over movement of personnel and vehicles during the construction phase, is anticipated to reduce the significance of these indirect impacts.

6.3.3. Beneficial Impacts

Includes impacts that have a positive, desirable or favourable impact on the sensitive resources or receptors (e.g. landscape providing artificial habitat for a variety of species, creating jobs during the construction and/or occupation phases of a project). No beneficial impacts have been identified for the proposed development.

6.3.4. Adverse Impacts

Impacts that are detrimental and have a negative influence on sensitive resources or receptors include the following:

Nature of Impact	Impact 6: Introduction of exotic and invasive plant and animal species to the area, or exacerbating the spread of existing infestations	
	Before Mitigation	After Mitigation
Sensitivity Value	High	Medium
Extent	Local (< 2km)	Local (< 2km)
Duration	Permanent	Medium term (>10 years)
Probability	Possible	Unlikely
Magnitude	Moderate	Negligible
Significance	Major - Moderate	Negligible - Minor
Reversibility	Medium	Medium
Mitigation Potential	Medium	High
Mitigation Actions	Develop and implement Alien and Invasive Plant and Animal Species Management Plan, with specific reference to feral cats. Develop identification procedures for rapid response and treatment. Implement annual monitoring programme to determine presence, abundance, spread, treatment and management procedures.	

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

Nature of Impact	Impact 7: Inappropriate harvesting of natural resources (plants and animals) and exacerbation of pressure on natural resources and species due to increased human encroachment	
	Before Mitigation	After Mitigation
Sensitivity Value	Medium	Low
Extent	Local (< 2km)	Local (< 2km)
Duration	Long term (life of operation)	Medium term (>10 years)
Probability	Possible	Unlikely
Magnitude	Minor	Negligible
Significance	Minor	Negligible - Minor
Reversibility	High	High
Mitigation Potential	High	High
Mitigation Actions	Control personnel and vehicular movement outside development footprint. Restrict all construction activities to development footprint only. Avoid peripheral impacts in natural habitat outside development footprint. No harvesting, picking, destroying of any plants outside development footprint. No trapping, snaring or killing of animals, collection of eggs, nests, etc.	

Discussion & Recommendations:

Adverse impacts are most often the result of uncontrolled personnel activities and actions outside perimeter of the development footprint and is likely to have impacts beyond the development footprint. Instituting proper control measures and restricting movement of personnel and vehicles to within the perimeter of the development footprint will reduce impacts significance to an acceptable level. Plants and animals should be left undisturbed at all times, no collection, harvesting, killing, trapping should be allowed under any circumstances. No animals should be fed, or kept as pets on site, with specific reference to feral cats.

6.3.5. Event Related Impacts

Potentially unplanned/ accidental impacts originating from an unintentional event such as fire, explosion, oil spill, etc.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

Nature of Impact	Disruption of important ecological processes, services, and infrastructure and altered ecological functionality (including fire, erosion) of surrounding areas and remaining natural habitat, as well as migratory patterns of animals species	
	Before Mitigation	After Mitigation
Sensitivity Value	High	Medium
Extent	Local (< 2km)	Local (< 2km)
Duration	Medium term (>10 years)	Short term (construction)
Probability	Possible	Unlikely
Magnitude	Minor	Negligible
Significance	Moderate - Minor	Negligible - Minor
Reversibility	High	High
Mitigation Potential	High	High
Mitigation Actions	Avoid peripheral impacts in adjacent natural habitat. Institute rehabilitation and aesthetic practices to ensure natural landscaping around perimeter. Ensure compliance with Crocodile River Nature Reserve EMP. Institute annual monitoring programme to ensure zero harm to environment.	

Discussion & Recommendations:

Inadvertent impacts, such as uncontrolled fires and exacerbated erosion, could potentially have impacts of a moderate significance on the floristic and faunal environment as a result of the disturbance factor. These impacts are easy to prevent through the development of fire prevention and control measures, rapid response actions, identification of problem areas, landscaping and rehabilitation actions.

6.4. Soil and agricultural potentialDiscussion & Recommendations:

An Agricultural Compliance Statement is not required to formally rate agricultural impacts. It is only required to indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site. Nevertheless, it is hereby confirmed that the agricultural impact of the proposed development is low.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

6.5. Heritage

Nature of Impact	Disruption of important ecological processes, services, and infrastructure and altered ecological functionality (including fire, erosion) of surrounding areas and remaining natural habitat, as well as migratory patterns of animals species	
	Before Mitigation	After Mitigation
Sensitivity Value	Low	Low
Extent	Local (< 2km)	Local (< 2km)
Duration	Medium term (>10 years)	Short term (construction)
Probability	Possible	Unlikely
Magnitude	Minor	Negligible
Significance	Moderate - Minor	Negligible - Minor
Reversibility	Not reversible	Not reversible
Mitigation Potential	High	High
Mitigation Actions	Avoid peripheral impacts in adjacent natural habitat. Institute rehabilitation and aesthetic practices to ensure natural landscaping around perimeter. Ensure compliance with Crocodile River Nature Reserve EMP. Institute annual monitoring programme to ensure zero harm to environment.	

Discussion & Recommendations:

No known sites are located within the impact area therefore no adverse impact to heritage resources is expected. Any additional effects to subsurface heritage resources can be successfully mitigated by implementing a chance find procedure. Impacts of the project on heritage resources is expected to be low during all phases of the development. No impacts are expected during the operation phase

6.6. Palaeontology

Nature of Impact	Palaeontology	
	Before Mitigation	After Mitigation
Sensitivity Value	Medium	Medium
Extent	Local (< 2km)	Local (< 2km)

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

Duration	High (where manifest)	High (where manifest)
Probability	Unlikely	Unlikely
Magnitude	Negligible	Negligible
Significance	Moderate - Minor	Negligible - Minor
Reversibility	Irreversible	Irreversible
Mitigation Potential	High	High
Mitigation Actions	The site visit showed that there are no surface stromatolites, but they might be present below the surface. Therefore, a Fossil Chance Find Protocol should be added to the eventual EMPr.	

Discussion & Recommendations:

Based on the nature of the project, surface activities may impact upon the fossil heritage if preserved in the development footprint. The geological structures suggest that the rocks are the correct age and type to preserve fossils. The site visit and walk through confirmed that there were NO FOSSILS in the project footprint. Furthermore, the material to be excavated is soils and sand and these do not preserve fossils. Since there is an extremely small chance that trace fossils may occur below ground and be disturbed, a Fossil Chance Find Protocol has been added to this report. Taking account of the defined criteria, the potential impact to fossil heritage resources is extremely low.

6.7. Noise

Nature of Impact	Construction Noise <ul style="list-style-type: none"> <input type="checkbox"/> Civils and concrete work <input type="checkbox"/> Mounting platforms for the BESS containers; <input type="checkbox"/> Internal access roads (4m – 6m wide) located within the site; <input type="checkbox"/> Fencing of approximately 3 m in height around the site and substation area; <input type="checkbox"/> Infrastructure within the site comprising office buildings, warehouses, parking and a laydown area; <input type="checkbox"/> Construction of the Power Lines.
	Two access roads (6m wide) of approximately 350 m in length each to access the site and substation area

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

	Before Mitigation	After Mitigation
Sensitivity Value	Medium (Social)	Low (Social)
Extent	Local (< 2km)	Local (< 2km)
Duration	Medium term (<1 year)	Short term (construction)
Probability	Probable	Unlikely
Magnitude	Minor	Negligible
Significance	7.98 Moderate to minor environmental significance	4.66 Negligible to minor environmental significance
Reversibility	High	High
Mitigation Potential	High	High
Mitigation Actions	<p>The construction activities should be limited to daytime (6am-6pm) and Monday to Friday only which will mitigate the possibility of night-time and weekend noise nuisance claims from the noise sensitive receptors.</p> <p>Further mitigation measures for the construction noise sources include:</p> <ol style="list-style-type: none"> 1. Construction areas should be closed off with earth berms where possible. 2. All construction vehicles must be well maintained and in good condition. 3. Noisy equipment such as generators, air compressors, etc. should be enclosed in soundproof enclosures. Many manufacturers of the specialised equipment will have soundproof enclosures that are purpose built for the equipment in question. 4. Construction staff working in areas where the 8-hour ambient noise is equal to or exceeds 85dBA, should be provided with ear protection equipment. 5. Particularly noisy operations must be scheduled appropriately and conducted after notifying sensitive receptors. 	

Discussion & Recommendations:

The continuous typical construction site noise will exceed the baseline noise measurements by 8.1 dB during the daytime and 15.2 dB during the night-time periods. This means that construction activities will be audible during the day and night-time periods and will be considered a noise disturbance. The construction phase is temporary and typically completed within one year.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

Nature of Impact	Operational phase of the BESS and associated infrastructure	
	Before Mitigation	After Mitigation
Sensitivity Value	Minor (Social)	Negligible (Social)
Extent	Local (< 2km)	Local (< 2km)
Duration	Medium term (>10 years)	Beyond life of project of facility / permanent
Probability	Probable	Unlikely
Magnitude	Minor	Negligible
Significance	9 Moderate to minor environmental significance	3.5 Negligible to minor environmental significance
Reversibility	High	High
Mitigation Potential	High	High
Mitigation Actions	As there is no detailed design or complete specification of the proposed BESS Facility, the following main noise generating activities were considered for a modelled investigated scenario(s): Area noise source at a noise level of 80 dBA for the Container area which includes Inverter and Battery Containers. This is considered the worst-case scenario.	

Discussion & Recommendations:

The operational noise levels at the proposed alternative site do not exceed the existing baseline noise levels during daytime period. The operational noise levels at the proposed alternative site exceeds the existing baseline noise levels during night-time period by between 2 and 6 dB.

CHAPTER 7: PROJECT'S CUMULATIVE IMPACTS

This category includes additive impacts that result from the incremental potential impacts of an activity, plus the potential impacts of reasonably anticipated future projects or subsequent phases of the development. Impacts of a cumulative nature often have little direct relationship with the activity but are reasonably expected to realise because of the project. Cumulative impacts represent the totality of impacts in a given area resulting from this activity and related (similar projects or activities that could conceivably be regarded as 'spin-offs' from this project), viewed in the context of past projects and other reasonably foreseeable future anthropogenic disruptive activities in the immediate region and how these activities impact upon the ecology of a region. The exact nature, duration, significance, and scale of cumulative impacts are challenging to quantify and extremely problematic to mitigate against. However, cumulative impacts are significant and require consideration during this process of mitigating impacts and managing the natural ecological environment of the region.

There is no similar project in the broader and surrounding areas. The proposed site is situated within the City of Tshwane Municipality, approximately 6.5 km north of Diepsloot, and 4.25 km west of Copperleaf Golf Estate. The wider region is urbanised and developed, characterised by extensive anthropogenic habitat transformation through urbanisation. However, vast areas of remaining natural and pristine habitat remain in the immediate region of the site. Urban developments are noted to the east and southeast of the site, characterised by a well-developed road network. From a wider perspective, it is noted that the site is situated on the perimeter of the highly urbanised region, which includes Centurion, Midrand, Muldersdrift, Krugersdorp and Diepsloot. At the same time, areas to the north and west largely comprise lower levels of anthropogenic disruption and transformation Biodiversity. It is not expected that there be cumulative impacts in respect of soil and agricultural potential, heritage, palaeontology, and noise.

However, noting the ecology of the area and as such, the project, the anticipated cumulative impacts include the following:

Nature of Impact	Exacerbation of existing levels of habitat fragmentation and isolation, considering past, present and reasonably foreseeable future anthropogenic disruptive activities	
	Before Mitigation	After Mitigation
Sensitivity Value	High	Medium
Extent	Local (< 2km)	Site

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

Duration	Permanent	Permanent
Probability	Definite	Possible
Magnitude	Minor	Negligible
Significance	Moderate - Minor	Negligible - Minor
Reversibility	Medium	Medium
Mitigation Potential	Medium	Medium
Mitigation Actions	Relocate development footprint to areas of lower sensitivity. Implement development buffer to protect adjacent areas, avoid impacts, movement in areas outside footprint. Restrict vehicle, personnel and construction activities to development footprint. Avoid losses of natural habitat outside development footprint	
Nature of Impact	Losses and associated impacts on local/ regional and national conservation efforts, targets, and obligations (loss of natural habitat)	
	Before Mitigation	After Mitigation
Sensitivity Value	High	Medium
Extent	Local (< 2km)	Local (< 2km)
Duration	Long term (life of operation)	Medium term (>10 years)
Probability	Possible	Improbable
Magnitude	Minor	Negligible
Significance	Moderate - Minor	Negligible - Minor
Reversibility	Medium	Medium
Mitigation Potential	Medium	Medium
Mitigation Actions	Relocate development footprint to areas of lower sensitivity. Implement development buffer to protect adjacent areas, avoid impacts, movement in areas outside footprint. Restrict vehicle, personnel and construction activities to development footprint. Avoid losses of natural habitat outside development footprint. Ensure compliance with CRR Management Plan. Implement annual monitoring programme.	

CHAPTER 8: IMPACT STATEMENT AND RECOMMENDATIONS

8.1. Impact statement

8.1.1. Biodiversity

The preferred location of the development will limit exposure of attributes of high floristic and faunal sensitivity and cumulative habitat losses on a local and regional scale. Any additional/ cumulative impacts on conservation important plant species and natural/ pristine habitat within the Crocodile River Reserve is considered significant and should be avoided. Although the location of the preferred site is still within the CRR, habitat contained within this area exhibit attributes of lower floristic and faunal sensitivity, and the significance of cumulative habitat loss is less severe. Selecting this area of lower sensitivity for the proposed development will also facilitate responsible development within the CRR, without compromising conservation objectives and priorities on a local and regional scale.

8.1.2. Faunal and Avifauna

The faunal richness of the area is heavily influenced by the spatial inclusion in the Crocodile River Nature Reserve. Ultimately, the study areas conform to a typical highveld environment, dominated by the dolomitic extrusions and the prevalence of a pristine, or near pristine herbaceous layer with scattered and isolated locally indigenous tree stands. A high ecological connectivity to natural habitat further to the north is noted. The homogenous nature of the topography within the site, as well as the small size, dictate that the actual faunal species complement will be lower than the wider region, but this does not exclude the opportunistic or periodic presence of conservation important fauna and bird species on the site, albeit mostly for migratory purposes.

Marginal differences are noted between habitat conditions of the principal and alternative sites, with habitat within the alternative site exhibiting slightly deteriorated conditions while habitat from the principal site is exhibit a high correlation to the regional ecological type. Ecological connectivity of the principal site is also slightly higher than the alternative site as a result of the proximity to deteriorated areas to the south of the site. An evaluation of habitat suitability for conservation important fauna and avifauna species that are considered likely, or moderately likely, to persist within the immediate region, indicated a moderate likelihood of occurrence within the principal site, compared to a moderately low likelihood of occurrence in the alternative site. A medium-high faunal sensitivity is ascribed to the principal site, while the alternative site exhibits attributes of medium sensitivity.

An evaluation of anticipated and likely impacts on the faunal and avian constituents and habitat from the respective sites indicated a higher significance from the principal site is expected. In particular, the loss of pristine and natural habitat, even on a local scale is considered significant. As such, the proposed development on the alternative site will be supported by this study. The recommended mitigation measure, if implemented timeously and comprehensively, is furthermore expected to reduce the significance level of anticipated impacts to an acceptable level.

8.1.3. Soil and agricultural potential

The site has low agricultural potential predominantly because of soil constraints and as a result the site is unsuitable for crop production. The proposed development site is verified in this assessment as being of less than high agricultural sensitivity. The agricultural impact of the proposed development is the, probably permanent, loss of 3.18 hectares of agricultural land that is currently not used for agricultural production and has very limited future production potential. This impact is assessed as having low significance.

The conclusion of this assessment is that the proposed development will not have an unacceptable negative impact on agricultural production capability. The proposed development is acceptable because the land is of limited soil capability and is not suitable for crop production. From an agricultural impact point of view, it is recommended that the development be approved. The conclusion of this assessment on the acceptability of the proposed development and the recommendation for its approval is not subject to any conditions.

8.1.4. Heritage

The proposed BESS facility footprint will total ~3.5ha in extent and will be established on a property which falls under the Crocodile River Reserve Doornrandje Cluster. According to the SAHRA palaeontological sensitivity, the study area is of very high palaeontological significance and was addressed in an independent study (Bamford 2022). The development footprint was assessed on a desktop level and by a pedestrian survey and no surface indicators of heritage resources were recorded. The lack of sites of heritage significance is in line with other surveys of the area (e.g.; Van der Walt 2018 & Van Schalkwyk 2002; 2007). No adverse impact to heritage resources is expected by the project and it is recommended that the project can commence on the condition that the following recommendations are implemented as part of the EMPr and based on approval from SAHRA. The overall impact of the project is considered to be low and residual impacts can be managed to an acceptable level through implementation of the recommendations made in this report. The socio-economic benefits also outweigh the possible impacts of the development if the correct mitigation measures are implemented for the project. The following

recommendations for Environmental Authorisation apply and the project may only proceed based on approval from SAHRA

8.1.5. Palaeontology

Based on the fossil record but confirmed by the site visit and walk through there are NO FOSSILS such as stromatolites in the exposed dolomites, even though fossils have been recorded from rocks of a similar age and type in South Africa. It is extremely unlikely that any fossils would be preserved in the overlying soils and sands of the Quaternary. There is a very small chance that fossils may occur in below the ground surface in the dolomites of the Oaktree and Monte Christo Formations, (Malmani Subgroup, Chuniespoort Group, Transvaal Supergroup) so a Fossil Chance Find Protocol should be added to the EMP. If fossils are found by the environmental officer, or other responsible person once excavations and drilling have commenced, then they should be rescued and a palaeontologist called to assess and collect a representative sample.

8.1.6. Noise

The outcome of the assessment indicated that some mitigation options are required during the construction phase and operational phase. Key mitigation options include:

- ☐ Construction Phase - The most important mitigation option is to ensure the construction occurs during daytime hours.
- ☐ Operational Phase - The most important mitigation option is to ensure that an acoustic consultant is appointed on the design team to ensure that final facility design meets the noise level requirements.

With mitigation measures implemented, the BESS Facility would comply with Gauteng Noise Control Regulations, 1999. In terms of noise assessment, the project does not present a fatal flaw. The project should be authorised regarding noise, with mitigation measures adhered to.

8.2. EAP's Recommendations

The screening report couples with the specialist findings for the proposed development indicated that there are no environmental fatal flaws or impacts of high significance. All identified impacts can be mitigated to acceptable levels through the implementation of specialist recommendation and proposed mitigation measures. It has been determined that the do nothing alternative will result in a missed prospects and will preserve only a insignificant portion of the site within the broader site. It is in the opinion of the EAP that the project's preferred site be authorised.

The Project Company must be bound to stringent conditions to maintain compliance and a responsible execution of the project. In order to achieve appropriate environmental management

standards and ensure that the findings of the environmental studies are implemented through practical measures, the recommendations from this BA study are included within an EMP. The EMP must be used to ensure compliance with environmental specifications and management measures. The implementation of this EMP for the construction phase of the project is considered to be vital in achieving the appropriate environmental management standards as detailed for this project

CHAPTER 9: REFERENCES

REPORT REFERENCE

<http://www.energy.gov.za/IRP/2019/IRP-2019.pdf>

http://www.treasury.gov.za/comm_media/press/2022/2022080501%20Operation%20Vulindlela%20Progress%20Update%20Q2%202022.pdf

<https://www.nationalgrid.com/stories/energy-explained/what-is-battery-storage>

<https://corporate.enelx.com/en/question-and-answers/what-is-battery-energy-storage>

BIODIVERSITY

ADU-UCT. 2017. *Animal Demography Unit Virtual Museum*. Available at: vmus.adu.org.za.

AGIS, 2007. Agricultural Geo-Referenced Information System, accessed from www.agis.agric.za on 2010.

BATES, M.F, BRANCH, W.R., BAUER, A.M., BURGER, M., MARAIS, J., ALEXANDER, G.J. & DE VILLIERS, M.S. (eds). 2014. Atlas and Red List of the Reptiles of South Africa, Lesotho, and Swaziland. *Suricata* 1. South African National Biodiversity Institute, Pretoria.

BAUER, H., PACKER, C., FUNSTON, P.F., HENSCHER, P. & NOWELL, K. 2016. *Panthera leo*. The IUCN Red List of Threatened Species 2016: e.T15951A115130419. <http://dx.doi.org/10.2305/IUCN.UK.2016-3.RLTS.T15951A107265605.en>

BAZELET, C. & NASKRECKI, P. 2014. *Aroegas fuscus*. The IUCN Red List of Threatened Species 2014: e.T20639359A56180116. <http://dx.doi.org/10.2305/IUCN.UK.2014-1.RLTS.T20639359A56180116.en>

BIRDLIFE INTERNATIONAL. 2020. *Sagittarius serpentarius*. The IUCN Red List of Threatened Species 2020: e.T22696221A173647556. <https://dx.doi.org/10.2305/IUCN.UK.2020-3.RLTS.T22696221A173647556.en>

BIRDLIFE SOUTH AFRICA. 2018. *BirdLife South Africa Checklist of Birds in South Africa*, 2018.

BUCKLAND, S.T., ANDERSON, D.R., BURNHAM, K.P., LAAKE, J.L. 1993. *Distance Sampling: Estimating abundance of biological populations*. Chapman and Hall, London.

CHILD, M.F., ROXBURGH, L., DO LINH SAN, E., RAIMONDO, D. & DAVIES-MOSTERT, H.T. (eds) 2016. *The Red List of Mammals of South Africa, Swaziland and Lesotho*. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa.

CLARKE, K.R. & WARWICK, R.M. 1994. *Changes in marine communities: An approach to statistical analysis and interpretation*. Natural Environmental Research Council, United Kingdom.

COHEN L, TAYLOR P, JACOBS D, KEARNEY T, MACEWAN K, MONADJEM A, RICHARDS LR, SCHOEMAN C, SETHUSA T. 2016. *A conservation assessment of Rhinolophus cohenae*. In Child MF, Roxburgh L, Do Linh San E,

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

Raimondo D, Davies-Mostert HT, editors. The Red List of Mammals of South Africa, Swaziland and Lesotho. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa.

COLWELL, R.K. 2013. ESTIMATES: STATISTICAL ESTIMATION OF SPECIES RICHNESS AND SHARED SPECIES FROM SAMPLES. VERSION 9. USER'S GUIDE AND APPLICATION PUBLISHED AT: [HTTP://PURL.OLC.ORG/ESTIMATES](http://purl.oclc.org/estimates).

CONVENTION ON BIOLOGICAL DIVERSITY. Signed 1993 and ratified 2 November 1995.

DAVIES-MOSTERT HT, PAGE-NICHOLSON S, MARNEWECK DG, MARNEWICK K, CILLIERS D, WHITTINGTON-JONES B, KILLIAN H, MILLS MGL, PARKER D, POWER J, REHSE T, CHILD MF. 2016. *A conservation assessment of Lycaon pictus*. In Child MF, Roxburgh L, Do Linh San E, Raimondo D, Davies-Mostert HT, editors. The Red List of Mammals of South Africa, Swaziland and Lesotho. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa.

DEL HOYO, J., ELLIOTT, A. & CHRISTIE, D.A. eds. 1992-2011. *Handbook of the Birds of the World*. Vol 1-16. Lynx Edicions, Barcelona.

DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND TOURISM. 2001. Environmental Potential Atlas. DEAT, Pretoria.

ENDANGERED WILDLIFE TRUST. 2002. The Biodiversity of South Africa 2002. Indicators, Trends and Human Impacts. Struik Publishers, Cape Town.

FISHPOOL, L.D.C. 1997. *Important Bird Areas in Africa: IBA criteria: categories, species lists and population thresholds*. BirdLife International, Cambridge.

FRIEDMANN, Y. & DALY, B. 2004. *Red Data Book of the Mammals of South Africa: A Conservation Assessment*. CBSG South Africa, Conservation Breeding Specialist Group (SSC/IUCN), Endangered Wildlife Trust, South Africa.

GILL, F, D Donsker, & P Rasmussen (Eds). 2021. IOC World Bird List (v 11.1). Doi 10.14344/IOC.ML.10.2. <http://www.worldbirdnames.org/>

GOBUSH, K.S., EDWARDS, C.T.T, BALFOUR, D., WITTEMYER, G., MAISELS, F. & TAYLOR, R.D. 2021. *Loxodonta africana*. The IUCN Red List of Threatened Species 2021: e.T181008073A181022663. <https://dx.doi.org/10.2305/IUCN.UK.2021-1.RLTS.T181008073A181022663.en>

GOVERNMENT GAZETTE [of the Republic of South Africa]. 2001. Amendments to the Conservation of Agricultural Resources Act, 1983 (Act No.43 of 1983). Government Gazette, 429 (22166) of 30 March 2001. Department of Agriculture, Republic of South Africa.

HARDAKER, T. 2019. *Southern African Bird List* - Version 09 - 06 July 2019.

HARDAKER, T. 2020. *Southern African Bird List* - Version 10.

HARRISON, J.A., ALLAN, D.G., UNDERHILL, L.G., HERREMANS, M., TREE, A.J., PARKER, V. & BROWN, C.J. (eds.). 1997. *The Atlas of Southern African Birds*. Vol. 1 & 2. BirdLife South Africa, Johannesburg.

HOCKEY, P.A.R., DEAN, W.R.J. & RYAN, P.G. (eds.) 2005. *Roberts – Birds of Southern Africa*, VIIth ed. The Trustees of the John Voelker Bird Book Fund, Cape Town.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

HOFFMAN T. & ASHWELL A. 2001. *Nature Divided: Land degradation in South Africa*. University of Cape Town Press, Cape Town

INTERNATIONAL UNION FOR CONSERVATION OF NATURE. 2020. <http://www.iucnredlist.org/>

ISBERG, S., COMBRINK, X., LIPPAI, C. & BALAGUERA-REINA, S.A. 2019. *Crocodylus niloticus*. *The IUCN Red List of Threatened Species* 2019: e.T45433088A3010181. <https://dx.doi.org/10.2305/IUCN.UK.2019-1.RLTS.T45433088A3010181.en>. Downloaded on 10 October 2021.

IUCN Red List of Threatened Species. Version 2019.1. <http://www.iucnredlist.org/>.

JACQUES, H., REED-SMITH, J. & SOMERS, M.J. 2015. *Aonyx capensis*. The IUCN Red List of Threatened Species. Version 2015.2. <http://www.iucnredlist.org/>.

KNOBEL, J. 1999. *The magnificent natural heritage of South Africa*. Sunbird Publishing, South Africa.

KRUSKAL, J.B. & WISH, M. 1978. *Multidimensional Scaling*. Sage Publications, London.

MAGURRAN, A.E. 1988. *Ecological diversity and its measurement*. Croom Helm, London

MARNEWICK, M.D., RETIEF, E.F., THERON, N.T., WRIGHT, D.R. AND ANDERSON, T.A. 2015. *Important Bird and Biodiversity Areas of South Africa*. Johannesburg: BirdLife South Africa.

MEASEY, G.L. (ed). 2010. Ensuring a future for South Africa's frogs: a strategy for conservation research on South African amphibians. *SANBI Biodiversity Series* 19, National Biodiversity Institute, Pretoria.

MECENERO, S, BALL, J.B., EDGE, D.A., HAMER, M.L., HENNING, G.A., KRÜGER, M., PRINGLE, E.L., TERBLANCHE, R.F. & WILLIAMS, M.C. (eds.) 2013. *Conservation assessment of butterflies of South Africa, Lesotho and Swaziland: Red list and atlas*. Safronics (Pty) Ltd., Johannesburg & Animal Demography Unit, Cape Town.

MILLER S, RIGGIO J, FUNSTON P, POWER RJ, WILLIAMS V, CHILD MF. 2016. *A conservation assessment of Panthera leo*. In Child MF, Roxburgh L, Do Linh San E, Raimondo D, Davies-Mostert HT, editors. *The Red List of Mammals of South Africa, Swaziland and Lesotho*. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa.

MINTER, L.R., BURGER, M., HARRISON, J.A., BRAACK, H.H., BISHOP, P.J. & KLOEPFER, D. 2004. *Atlas and Red data Book of the Frogs of South Africa, Lesotho and Swaziland*. SI/MAB Series #9. Smithsonian Institution, Washington, D.C.

MORENO, C. E. & HALFTER, G. 2000. Assessing the completeness of bat biodiversity inventories using species accumulation curves. *Journal of Applied Ecology* 37, 149– 158.

MPUMALANGA TOURISM AND PARKS AGENCY. MBSP Terrestrial Assessment 2014 [Vector] 2014. Available from the Biodiversity GIS website, downloaded on 02 July 2020

MUCINA, L. & RUTHERFORD, M.C. (eds.). 2006. The vegetation of South Africa, Lesotho and Swaziland. *Strelitzia* 19. South African National Biodiversity Institute, Pretoria.

NASKRECKI, P. 1996. Systematics of the southern African Meconematinae (Orthoptera: Tettigoniidae). *African Journal of Zoology* 110(2): 159-193.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

NATIONAL ENVIRONMENTAL MANAGEMENT BIODIVERSITY ACT, 2004 (Act No. 10 of 2004).

PIETERSEN D, JANSEN R, SWART J, KOTZE A. 2016. *A conservation assessment of Smutsia temminckii*. In Child MF, Roxburgh L, Do Linh San E, Raimondo D, Davies-Mostert HT, editors. The Red List of Mammals of South Africa, Swaziland and Lesotho. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa.

SELIER SAJ, HENLEY M, PRETORIUS Y, GARAI M. 2016. *A conservation assessment of Loxodonta africana*. In Child MF, Roxburgh L, Do Linh San E, Raimondo D, Davies-Mostert HT, editors. The Red List of Mammals of South Africa, Swaziland and Lesotho. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa.

SKINNER, J.D. & CHIMIMBA, C.T. (Revisers). 2005. *Mammals of the Southern African Subregion*. Cambridge University Press, London.

STUART, C. & STUART, M. 2015. *Stuart's Field Guide To Mammals Of Southern Africa, including Angola, Zambia and Malawi*. Struik Nature, Cape Town.

SUTHERLAND, W.J. (ed.). 2006. *Ecological Census Techniques*, 2nd ed. Cambridge University Press, UK.

TARBOTON, W.R & ALLEN, D.G. 1984. The status and the conservation of birds of prey in the Transvaal. *Transvaal Mus. Monograph* 3.

TAYLOR A, AVENANT N, SCHULZE E, VILJOEN P, CHILD MF. 2016a. *A conservation assessment of Redunca fulvorufula fulvorufula*. In Child MF, Roxburgh L, Do Linh San E, Raimondo D, Davies-Mostert HT, editors. The Red List of Mammals of South Africa, Swaziland and Lesotho. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa.

TAYLOR PJ, BAXTER R, POWER RJ, MONADJEM A, CHILD MF. 2016b. *A conservation assessment of Crocidura maquassiensis*. In Child MF, Roxburgh L, Do Linh San E, Raimondo D, Davies-Mostert HT, editors. The Red List of Mammals of South Africa, Swaziland and Lesotho. South African National Biodiversity Institute and Endangered Wildlife Trust, South Africa.

TAYLOR, M.R., PEACOCK, F. & WANLESS, R. (eds.). 2015. *The Eskom Red Data Book of Birds of South Africa, Lesotho and Swaziland*. BirdLife South Africa, Johannesburg.

TAYLOR, P. 1998. *The smaller mammals of KwaZulu-Natal*. University of Natal Press, Pietermaritzburg.

THREATENED SPECIES PROGRAMME (TSP). 2007. *Interim Red Data List of South African Plant Species*. Produced in collaboration with the National Botanical Institute (NBI), NORAD and the Department of Environmental Affairs and Tourism (DEAT).

UNEP. 2002. *Global Environment Outlook –3: Past, present, and future perspectives*. United Nations Environment Programme, Earthscan Publications Ltd, London.

VAN RIET, W., P. CLAASSEN, J. VAN RENSBURG, T. VILJOEN & L. DU PLESSIS. 1997. *Environmental Potential Atlas for South Africa*. J.L. van Schaik, Pretoria.

VAN WILGEN B.W. & VAN WYK E. 1999. *Invading alien plants in South Africa: impacts and solutions*. In: People and rangelands building the future.

VAN WYK B. & GERICKE N. 2000. *People's Plants*. Briza Publications, Pretoria.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

VISSER D.J.L. (1984). The Geology of the Republics of South Africa, Transkei, Bophutatswana, Venda and Ciskei and the Kingdoms of Lesotho and Swaziland. Fourth Edition. Department of Mineral and Energy Affairs. Republic of South Africa.

WATSON, D.M. 2003. The 'standardized search': An improved way to conduct bird surveys. *Austral Ecology* 28: 515-525.

WIESEL, I., MAUDE, G., SCOTT, D. & MILLS, G. 2008. *Hyaena brunnea*. In: IUCN 2010. IUCN Red List of Threatened Species. Version 2010.4. <http://www.iucnredlist.org/>.

WILSON, D.E. & MITTERMEIER, R.A. eds 2009. *Handbook of the mammals of the world. Vol 1. Carnivores*. Lynx Editions, Barcelona.

WOOD, J., Low, A.B., Donaldson, J.S., & Rebelo, A.G. 1994. *Threats to plant species through urbanisation and habitat fragmentation in the Cape Metropolitan Area, South Africa*. In: Huntley, B.J. (Ed.) Botanical Diversity in Southern Africa. National Botanical Institute, Pretoria.

WOODHALL, S. 2005. *Field guide to the butterflies of South Africa*. Struik Publishers, Cape Town.

WYNBERG R. 2002. A decade of biodiversity conservation and use in South Africa: tracking progress from the Rio Earth Summit to the Johannesburg World Summit on Sustainable Development. *South African Journal of Science* 98: 233-243.

SOIL AND AGRICULTURAL POTENTIAL

Department of Agriculture, Forestry and Fisheries, 2017. National land capability evaluation raster data layer, 2017. Pretoria.

Department of Agriculture, Forestry and Fisheries, 2002. National land type inventories data set. Pretoria.

ARCHAEOLOGICAL

Archaeological Database Wits University Referenced 2009

Bergh, J.S., (ed.) Geskiedenisatlas van Suid-Afrika. Die vier noordelike provinsies. Pretoria: J. L. van Schaik Uitgewers. 1999.

Huffman, T.N. 2007. Handbook to the Iron Age: The Archaeology of Pre-Colonial Farming Societies in Southern Africa. University of KwaZulu-Natal Press, Scottsville.

Rasmussen, R.K. 1978 Migrant kingdom: Mzilikazi's Ndebele in South Africa. London: Rex Collings

Ross, R. A concise history of South Africa. Cambridge University Press. Cambridge. 1999.

SAHRA Report Mapping Project Version 1.0, 2009

SAHRIS (Cited 2016)

Van Schalkwyk, J.A. 1998. A Survey of Cultural Resources in The Midrand Municipal Area, Gauteng Province. Unpublished report.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

Van Schalkwyk, J. 2002 A Survey of Cultural Resources for Laezenia,

Van Schalkwyk, J. 2007. Heritage Impact Assessment: Hennopsriver Development

Van Schalkwyk, J. 2013 . Basic Cultural Heritage Assessment for The Proposed Diepsloot East Power Line and New Substation, Gauteng Province

PALAENTOLOGY STUDY

Beukes, N.J., 1987. Facies relations, depositional environments and diagenesis in a major early Proterozoic stromatolitic carbonate platform to basinal sequence, Campbellrand Subgroup, Transvaal Supergroup, southern Africa. *Sedimentary Geology* 54, 1-46.

Eriksson, P.G., Altermann, W., Hartzer, F.J., 2006. The Transvaal Supergroup and its pre-cursors. In: Johnson, M.R., Anhaeusser, C.R. and Thomas, R.J., (Eds). *The Geology of South Africa*. Geological Society of South Africa, Johannesburg / Council for Geoscience, Pretoria. pp 237-260

Plumstead, E.P., 1969. Three thousand million years of plant life in Africa. Geological Society of southern Africa, Annexure to Volume LXXII. 72pp + 25 plates.

NOISE SPECIALIST STUDY

Environment Conservation Act, 1989 (Act 73 of 1989).

National Environment Management Act (NEMA 2006).

Noise Control Regulations (Attached to the Act No 73 of 1989).

Occupational Health and Safety Act, 1993.

SANS 10328: 2008. 'Methods for environmental noise impact assessments.'

SANS 10103:2008. 'The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication.'

SANS 10357: 2004. 'The calculation of sound propagation by the Concawe method.'

"SoundPLAN, designing a sound environment." URL <http://www.soundplan.com/>.

The Constitution of the Republic of South Africa Act, 1996 (Act No. 108 of 1996)

MAJOR HAZARD INSTALLATION

"National Environmental Management Act No 107 of 1998 and its Regulations. Government Gazette No 19519 of 27 November 1998.

"Environmental Impact Assessment Regulations 2014 as amended", Government Gazette No 326 of 7 April 2017.

SABS, "SANS 10228 – The Identification and Classification of Dangerous Goods for Transport", Standards South Africa, Pretoria, 2012.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

SABS, "SANS 10234 – Globally Harmonize System of classification and labelling of chemicals (GHS)", SABS, Pretoria 2008.

SABS, "Supplement to SANS 10234 – List of classification and labelling of chemicals in accordance with the Globally Harmonize System (GHS)", SABS, Pretoria, 2008.

SABS, "SANS 10160: part 4: Basis of structural design and actions for buildings and industrial structures Part 4 seismic actions and general requirements for building", SABS, Pretoria, 2011.

SABS, "SANS10313: Protection against lightning – physical damage to structure and life hazard", SABS, Pretoria, 2012.

DNV-GL, Recommended Practice – Safety, operation and performance of grid-connected energy storage systems, DNVGL-RP-0043, September 2017

IEC, "IEC 62619 – Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety Requirements or secondary lithium cells and batteries for use in industrial applications", Feb 2017.

Hare, G. "Batteries – What's the Problem", Brandz, Fire and Emergency New Zealand Research Report 174. Jan 2020.

DNV-GL, 'McMicken Battery Energy Storage Systems Event – Technical Analysis and Recommendations, July 2020.

DNV-GL, 'Quantitative risk analysis for battery energy storage sites", 17 May 2019.

Energy Response Solutions, "Energy Storage Systems Safety - Comparing Vanadium Redox Flow and Lithium-Ion Based Systems ", Aug 2017.

Wikipedia, "Vanadium redox Batteries".

Bushveld Minerals and Energy, "Energy Storage and Vanadium Redox Flow batteries 101", 13 November 2018.

Whitehead A.H, Rabbow T.J, Trampert M, Pokorny P, "Critical safety features of the vanadium redox flow battery", Volume 351, 31 May 2017, Pages 1-7.

ESI AFRICA, "The vanadium redox flow battery, a leading technology in energy storage", Aug 8, 2019.

Noak J, Roznyatovskaya N, Menictas C and Skyllas-Kazacos AM, "Redox flow batteries for renewable energy storage", 21 Jan 2020.

Global Sustainable Energy Solutions, "Battery Storage Systems: What are their chemical hazards?", GSES Technical Papers, 2016, www.gses.com.au.

University of Washington Environment Health and Safety, "Lithium Battery Safety", www.ehs.washington.edu, April 2018.

Hesler, P & Travers, K.A., "Lithium-ion Battery Energy Storage Systems - The risks and how to manage them", AIG, 17 July 2019.

Verhaegh, N., van de Burgt, J., Tiggelman, A and Mulder G. "STALLION Handbook on safety assessment for large Scale, stationary, grid-connected Lithium -ion energy Storage Systems", Arnhem, March 2015.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED BESS AND ASSOCIATED INFRASTRUCTURE

TESLA, Battery Emergency Response Guide (Lithium-ion), 17 Dec 2019.

Tesla, MegaPack – Datasheet Safety Overview.

St John, J, “SunEdison Buys Solar Grid Storage for Battery-Backed PV and Wind Power”, Greentechmedia.com, 5 March 2015.

Energy Storage Association, “Operation Risk Management in the US Energy Storage Industry: Lithium Ion Fire and Thermal Event Safety”, Sept 2019.