
DEVELOPMENT OF AN ACCESS ROAD AND INFRASTRUCTURE ASSOCIATED WITH THE APPROVED WITBERG WIND FARM, NEAR MATJIESFONTEIN, WESTERN CAPE PROVINCE

ENVIRONMENTAL MANAGEMENT PROGRAMME

June 2023

Prepared for

Red Rocket South Africa (Pty) Ltd
14th Floor Pier Place Building,
31 Heerengracht Street,
Foreshore,
Cape Town
8001

Prepared by:

Savannah Environmental (Pty) Ltd

First Floor, Block 2, 5 Woodlands Drive Office Park
Woodmead
Johannesburg, 2191
Tel: +27 (0)11 656 3237
Fax: +27 (0)86 684 0547
E-mail: info@savannahsa.com
www.savannahsa.com

savannah
environmental

PROJECT DETAILS

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Authors	:	Savannah Environmental Jo-Anne Thomas Chantelle Geyer
Specialists	:	CTS Heritage The Biodiversity Company FEN Consulting NCC Environmental Services (Pty) Ltd
Applicant	:	Red Rocket South Africa (Pty) Ltd
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DEFINITIONS AND TERMINOLOGY

The following definitions and terminology may be applicable to this project and may occur in the report below:

Alien species: A species that is not indigenous to the area or out of its natural distribution range.

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

Assessment: The process of collecting, organising, analysing, interpreting and communicating information which is relevant.

Biological diversity: The variables among living organisms from all sources including, terrestrial, marine and other aquatic ecosystems and the ecological complexes they belong to.

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.

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

Cumulative impacts: 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.

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

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

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

Ecosystem: A dynamic system of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

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

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

Environmental Authorisation (EA): means the authorisation issued by a competent authority (Department of Forestry, Fisheries and the Environment) of a listed activity or specified activity in terms of the National Environmental Management Act (No 107 of 1998) and the EIA Regulations promulgated under the Act.

Environmental Assessment Practitioner (EAP): An individual responsible for the planning, management and coordinating of environmental management plan or any other appropriate environmental instruments introduced by legislation.

Environmental Control Officer (ECO): An individual appointed by the Owner prior to the commencement of any authorised activities, responsible for monitoring, reviewing and verifying compliance by the EPC Contractor with the environmental specifications of the EMPr and the conditions of the Environmental Authorisation

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

Environmental impact assessment: Environmental Impact Assessment, as defined in the NEMA EIA Regulations, is a systematic process of identifying, assessing and reporting environmental impacts associated with an activity.

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 plan that organises and co-ordinates mitigation, rehabilitation and monitoring measures in order to guide the implementation of a project or facility and its ongoing maintenance after implementation.

Environmental Officer (EO): The Environmental Officer (EO), employed by the Contractor, is responsible for managing the day-to-day on-site implementation of this EMPr, and for the compilation of regular (usually weekly) Monitoring Reports. The EO must act as liaison and advisor on all environmental and related issues

and ensure that any complaints received from the public are duly recorded and forwarded to the Site Manager and Contractor.

Environmental Site Compliance Officer (ESCO): An individual appointed by the Developer prior to and during the commencement of any authorised activities, to oversee on-site compliance management and EMPr implementation on a day-to-day basis.

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.

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.

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

Method Statement: a written submission by the Contractor in response to the environmental specification or a request by the Site Manager, setting out the plant, materials, labour and method the Contractor proposes using to conduct an activity, in such detail that the Site Manager is able to assess whether the Contractor's proposal is in accordance with the Specifications and/or will produce results in accordance with the Specifications.

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

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

Red Data Species: Species listed in terms of the International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species, and/or in terms of the South African Red Data list. In terms

of the South African Red Data list, species are classified as being extinct, endangered, vulnerable, rare, indeterminate, insufficiently known or not threatened (see other definitions within this glossary).

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

Vulnerable species: A taxon is Vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium-term future.

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*.

Working area: The land and any other place on, under, over, in or through which the Works are to be executed or carried out, and any other land or place made available by the developer in connection with the Works. The Working Area shall include the site office, construction camp, stockpiles, batching areas, the construction area, all access routes, and any additional areas to which the Construction Manager permits access. The construction footprint must be kept to a minimum.

ABBREVIATIONS

The following abbreviations may be applicable to this project and may occur in the report below:

BA	Basic Assessment
BGIS	Biodiversity Geographic Information System
CEMP	Construction Environmental Management Plan
DEA&DP	Department of Environmental Affairs, and Development Planning
DFFE	Department of Forestry, Fisheries, and the Environment
DMRE	Department of Minerals and Energy
EAP	Environmental Impact Practitioner
EHS	Environmental, Health and Safety
EMPr	Environmental Management Programme
GPS	Global Positioning System
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
LUDS	Land Use Decision Support
LUPO	Land Use Planning Ordinance
NEMA	National Environmental Management Act
NEMAA	National Environmental Management Amendment Act
NEMBA	National Environmental Management: Biodiversity Act
NERSA	National Energy Regulator of South Africa
NHRA	National Heritage Resources Act
NID	Notice of Intent to Develop
NSBA	National Spatial Biodiversity Assessment
NWA	National Water Act
PIA	Paleontological Impact Assessment
SACAA	South African Civil Aviation Authority
SAHRA	South African National Heritage Resources Agency
SANBI	South Africa National Biodiversity Institute
SANS	South Africa National Standards
SDF	Spatial Development Framework
ZoR	Zone of Regulation

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CHAPTER 1: INTRODUCTION

This Environmental Management Programme (EMPr) has been compiled for a new access road and associated infrastructure, upgrading of a district road, DR01469, as well as the widening and upgrade of a farm road, which is associated with the authorised Witberg Wind Farm. The project site is located within Ward 2 of the Laingsburg Local Municipality, which falls within the jurisdiction of the greater Central Karoo District Municipality in the Western Cape Province. The proposed access road is located within the footprint of the authorised Witberg Wind Farm and can be accessed via the N1 notional road located north of the project site. The project is located on the following farm portions:

Access Road Corridor:

- » Remaining Extent of Farm Elandskrag 269
- » Portion 1 of Farm Elandskrag 269

Constable Farm Road Corridor:

- » Portion 8 of Farm Constable 154
- » Remaining Extent of Farm Constable 154

District Road Corridor:

- » Remaining Extent of Farm Kragas Drift 159
- » Portion 2 of Farm Kragas Drift 159
- » Portion 1 of Farm Annex Kraga 158
- » Remaining Extent of De Hoop Farm 156
- » Remaining Extent of Farm Constable 154

This EMPr has been developed on the basis of the findings of the Basic Assessment (BA) and must be implemented to protect sensitive on-site and off-site features through avoiding or minimising potential impacts and controlling construction, operation and decommissioning activities that could have a detrimental effect on the environment. All mitigation measures recommended in the BA Report and associated specialist reports, as well as all conditions of the Environmental Authorisation must be implemented.

This EMPr is applicable to all employees and contractors working on the pre-construction, construction, and operation and maintenance phases of the project. In terms of the Duty of Care provision in S28(1) of NEMA, the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with this project is avoided, halted or minimised. The document must therefore be adhered to and updated as relevant throughout the project life cycle. This document fulfils the requirement of the EIA Regulations, 2014 (as amended) and forms part of the BA Report for the project.

CHAPTER 2: PROJECT DETAILS

Red Rocket South Africa (Pty) Ltd, an independent power producer in South Africa, is proposing the development of a new access road and infrastructure, as well as the widening and upgrading of the existing district road, DR01469, which is associated with the authorised Witberg Wind Farm. The Witberg Wind Farm is a Preferred Bidder project under the Private Purchase Agreement (PPA), construction for which has already commenced. The access road is required in addition to the already authorised access road to accommodate heavy vehicles for the delivery of heavy components and equipment for construction purposes (such as turbine blades, nacelles, etc.) to the authorised Witberg Wind Farm. A newly proposed construction camp and laydown area will be required since the location of the proposed new construction camp is the most logically optimal location for the construction and operation of this access road. The new construction camp and laydown area is also most optimal and centrally located for distribution of heavy components and equipment within the Witberg Wind Farm.

The proposed development will consist of the following:

- » A new access road with a permanent width up to 6m and a length of approximately 9.5km within a road reserve of up to 18m to accommodate limited cuttings which are required due to the steep terrain and the required earthworks. A 50m corridor for this road is being considered in the Basic Assessment process.
- » Widening and upgrade of the Constable farm road. A 15m corridor for this road is being considered in the Basic Assessment process.
- » Upgrade of an existing district road (DR01469). A 15m corridor for this road is being considered in the Basic Assessment process.
- » Construction of a construction camp of 8ha and a laydown area of 1ha respectively.

An Environmental Authorisation for the project was issued by the Department of Forestry, Fisheries and the Environment (DFFE) on 15 March 2023.

2.1 Project Site

The project site is located within the Laingsburg Local Municipality which falls within the jurisdiction of the greater Central Karoo District Municipality in the Western Cape Province. The proposed access road is located within the footprint of the authorised Witberg Wind Farm and can be accessed via the N1 national road located north of the project site (refer to **Figure 2.1**). The project is located on the following farm portions:

Access Road Corridor:

- » Remaining Extent of Farm Elandskrag 269
- » Portion 1 of Farm Elandskrag 269

Constable Farm Road Corridor:

- » Portion 8 of Farm Constable 154
- » Remaining Extent of Farm Constable 154

District Road Corridor:

- » Remaining Extent of Farm Kragas Drift 159
- » Portion 2 of Farm Kragas Drift 159

- » Portion 1 of Farm Annex Kraga 158
- » Remaining Extent of De Hoop Farm 156
- » Remaining Extent of Farm Constable 154

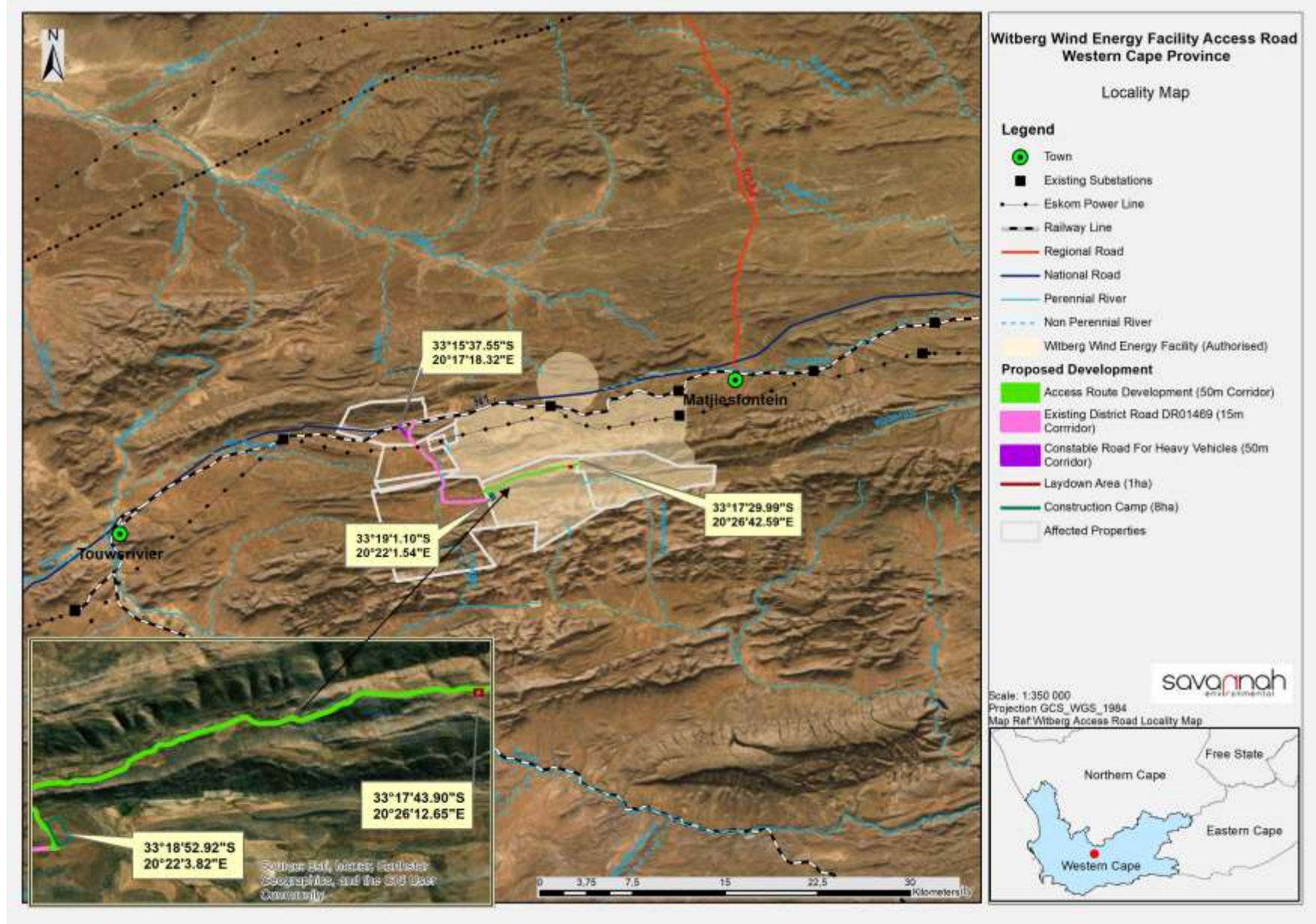


Figure 2.1: Locality map of the proposed Witberg access road and associated infrastructure.

2.2 Project Description

Table 2.1 provides a summary of the details and dimensions of the proposed access road and associated infrastructure for the Witberg Wind Farm considered as part of the Basic Assessment process.

Table 2.1: Details of the proposed access road and associated infrastructure for the Witberg Wind Farm

Description	Footprint, dimensions and details
Access Road	Gravel road Length: 9.5km Width: 6m with an 18m reserve for construction
Coordinates of Access Road	Start: 33°19'01.10"S 20°22'01.54"E Middle: 33°17'57.68"S 20°23'55.79"E End: 33°17'30.55"S 20°26'42.34"E
District Road DR01469	Gravel Road Length: 12km Width: 6m with a 20m reserve
Coordinates of District Road	Start: 33°15'31.28"S 20°18'06.76"E Middle: 33°18'12.86"S 20°19'32.93"E End: 33°19'01.10"S 20°22'01.54"E
Constable and Supporting Constable Farm Roads	Gravel Road Length: 3km Width and servitude: 6m
Coordinates of Constable Farm Road	Start: 33°15'37.55"S 20°17'18.32"E Middle: 33°15'54.22"S 20°17'36.31"E End: 33°16'10.25"S 20°17'54.31"E
Coordinates of Supporting Constable Farm Road	Start: 33°15'43.72"S 20°16'35.30"E Middle: 33°15'42.88"S 20°16'59.23"E End: 33°15'39.25"S 20°17'25.85"E
Laydown Areas	Construction Camp Area: 8ha Laydown Area Area: 1ha
Coordinates of Laydown Area 1	33°18'52.88"S 20°22'04.24"E
Coordinates of Laydown Area 2	33°17'44.21"S 20°26'12.58"E

Figure 2.2 provides an overview of the layout proposed for the project.

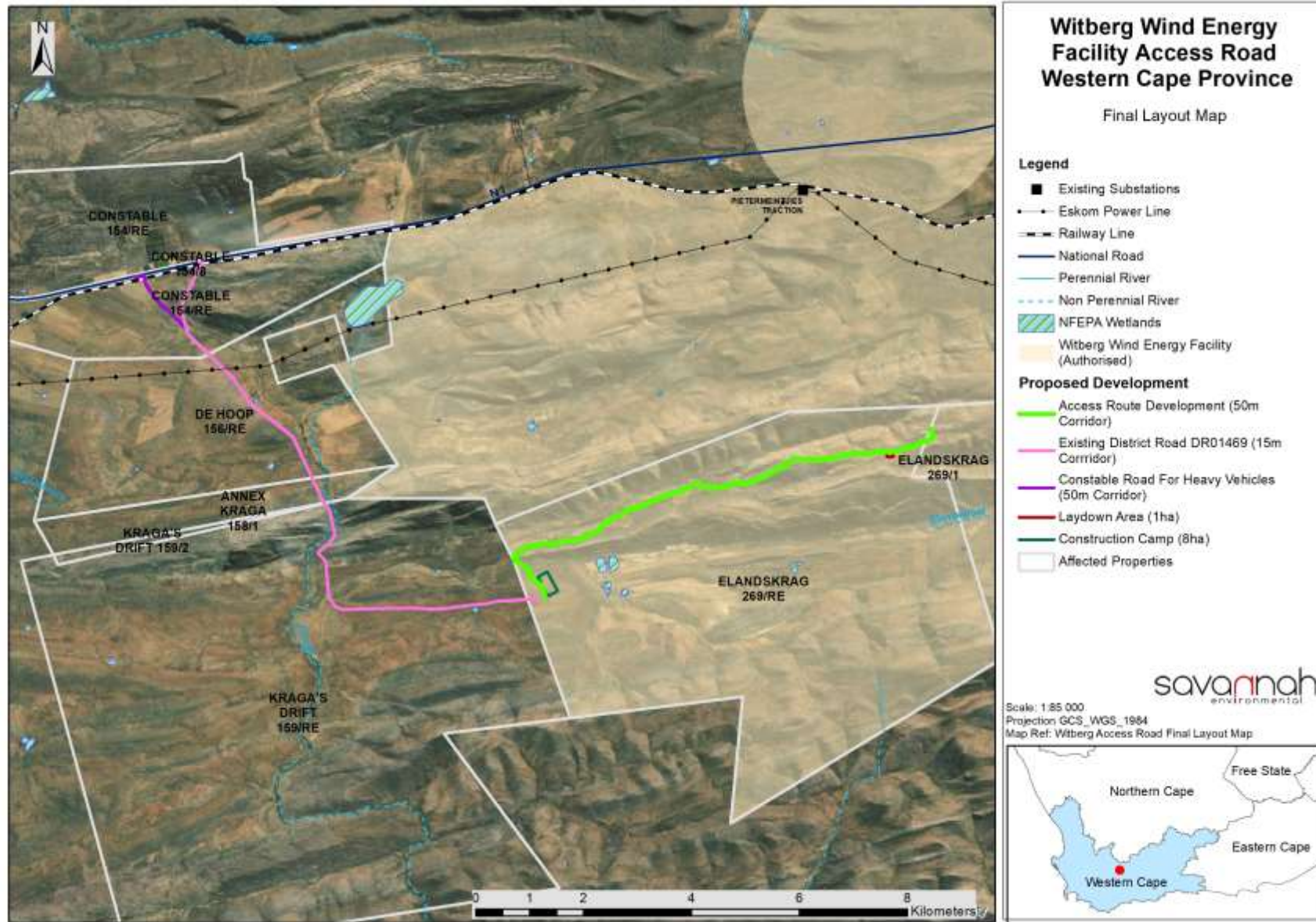


Figure 2.2: Final layout map of the proposed Witberg access road and associated infrastructure.

2.3 Findings of the Basic Assessment (BA)

No environmental fatal flaws were identified in the detailed specialist studies conducted, and no impacts of unacceptable or high significance are expected to occur with the implementation of the recommended mitigation measures.

Impacts identified to be associated with the proposed project and considered within this report include:

- » Impacts on ecology (including flora, fauna);
- » Impacts on freshwater resources;
- » Impact on soils and agricultural potential; and
- » Impact on heritage resources

2.3.1. Impacts on Ecology

The site is located within a varied terrestrial ecosystem comprising mostly sclerophyllous and succulent karroid and fynbos vegetation types, folded sandstone mountains and ridgelines bisected by streams, plateaus, and sandy flats. It is recorded and being within the Western Fynbos-Renosterveld Bioregion. Due to the low nutrient value and high level of polyphenols in the vegetation large herds of big mammals are absent along with tall trees. The overall system is driven primarily by edaphic and hydrological influences on vegetation which comes as a result of topographic variance (rocky, shallow mountainous soils versus deep alluvial plains). This is further influenced by the occurrence of seasonal fires every few years as a vital regeneration agent /driver especially for pyroclastic species which are dependent upon it. Winter rainfall, high altitude and extreme variance in summer and winter temperatures further influence the floral and faunal component that has adapted to and can survive in the landscape.

The variety of vegetation types, ecotones and landscape features create a myriad of varied habitats within a relatively small geographical area resulting in increased biodiversity potential. It is in part this highly varied aspect of the area that has helped to ascribe a terrestrial biodiversity sensitivity rating of Very High as variance in habitat equates to diversity of species.

The project is for the vast majority a linear site and taking into account that it only involves widening the existing roads (Konstabel and upgrading District Road DR01469), and widening existing jeep tracks, that extends from the District Road and travels to the East up the mountain, to function as the newly proposed access road to the Witberg Wind Farm, as well as the clearing of two small areas there is not likely to be any negative effect on these large-scale ecological drivers or processes of the system.

The project site falls within an area of terrestrial biodiversity listed as 'Very High' sensitivity based primarily off the biodiversity spatial planning layer which ascribes parts of the site as CBA and other parts as ESAs. The site is assessed as having a 'High' terrestrial biodiversity as the CBA area has only marginal influence of the sensitive vertebrate listed, and the vegetation types found within are of least concern. The ESAs, which comprise stream riparian zones, do play an important role in protecting the water sources of the area. The abiotic elements of the general locality are diverse and resultant in high levels of variance and biodiversity. The variety of vegetation types (ecotonal arrangements) because of these factors increases habitat and subsequent species diversity both in terms of flora and fauna.

The project site has however been chosen to utilise existing roads, much which would have no further impact on ecology, as they simply need to be graded whereas only one section of road needs to be widened which is an existing a jeep track that will function as the newly proposed access road. The impact on fauna is expected to be minimal as it is a narrow area of pre-existing road from where animals can easily move. The immovable flora along the edges will be lost but no significant impact is expected due to the fine scale of the clearance needed and the expected provision of botanical search and rescue for any appropriate SCC. Within the site camp and laydown areas similar Low significant impact of fauna is expected and whilst there may be a greater impact of individual flora species botanical search and rescue can mitigate against this and eventual restoration of the sites with locally suitable material will reduce the impact.

The overall ecosystem processes and large-scale environmental facets of concern such as corridor movement, feeding and breeding grounds, ecosystem drivers, including hydrological influences on vegetation and species composition of which this report is primarily concerned will not be altered at all. There is no impact on any of these large landscape scale processes and environmental functions thus no disruption to any ecosystem services. Biodiversity spatial planning layers will receive a slight reduction in remaining hectares which cumulatively can add up but currently does not pose any threat or change to vegetation type or species threat status.

The ecology specialist concluded that the proposed access road and associated infrastructure will inevitably impact on the local biodiversity as a result of vegetation clearance and regular disturbance during the operational phase. Apart from having the site camp area of the project site situated in a CBA, for which there is no other suitable area evident, the site is well chosen making use of existing roads and jeep tracks, to be upgraded to function as a new access road to the wind farm, and thereby limiting vegetation clearance and environmental impacts on terrestrial biodiversity. Even with part of a CBA area in use the project is likely to only have Medium to Low significant impacts that can be mitigated against as in the case of laydown areas in the CBA zone, ecologically restored.

There is no impact on, or from disruption of, the large-scale ecological processes or environmental drivers that are present within the area. This assertion is the primary purpose of this terrestrial biodiversity specialist report which confirms the site to be of 'High' terrestrial biodiversity value, however, minimally impacted upon thus having no significant reason not to support the development of the site.

2.3.2. Impacts on Freshwater Resources

Watercourses associated with the Kragga and Elandsloof River systems were identified to be at potential risk from the Witberg access road and associated infrastructure. These watercourses include several headwater episodic drainage lines (EDLs) without riparian vegetation which confluence with larger ephemeral tributaries and rivers in the valley bottom position were identified. Although these episodic drainage lines cannot be classified as rivers or streams in the traditional sense thereof due to the lack of saturated soil and riparian vegetation, they do still function as waterways, due to the episodic conveyance of water.

The Witberg access road traverses several watercourses at existing (proposed to be upgraded) and potentially new crossings through watercourses, particularly for the section of Witberg access road proposed to be developed from upgrading existing jeep tracks. The north-western section of the Witberg access road is located directly adjacent to an ephemeral tributary of the Kragga River system for a distance of approximately 4,5 km. The proposed construction camp is located outside the delineated extent of the watercourses, approximately 60 m from the delineated extent, thus within the 100 m Government Notice (GN)

509 of 2016 regulated area (in the absence of modelled floodlines). However, the proposed laydown area is located approximately 150 m outside the nearest watercourse and thus outside the 100 m GN509 regulated area. The risk significance of this laydown area was not considered as it is not located within the 100 m GN509 regulated area.

Due to the ecological sensitivity and importance of the identified watercourses, the construction and upgrading activities associated with the Witberg access road, which involve the upgrading of existing and potential creation of new crossings through watercourses, was determined to pose a Moderate risk significance to the watercourses, with the application of the recommended mitigation measures. Despite the direct negative impacts expected from the proposed Witberg access road, provided that strict enforcement of cogent, well-developed mitigation measures as outlined in the aquatic specialist report takes place, with specific mention of ensuring all instream construction footprints are rehabilitated and the watercourses are monitored for any alien and invasive species establishment, no fatal flaws in terms of freshwater ecological aspects were identified. Should crossing structure development and upgrading of the Witberg access road take place in the low flow season, the risk to the receiving environment will be significantly reduced.

The significance of impacts arising from the proposed construction camp located outside of the watercourses but within the 100 m GN509 ZoR are likely to be of very low significance assuming that strict enforcement of cogent, well-developed mitigation measures takes place, as recommended in this report. The proposed laydown area is located outside the 100 m GN509 ZoR, and thus not expected to pose a quantum of risk to the identified watercourses due to its distance from the watercourses and location outside the 100 m GN509 ZoR.

Provided that adherence to cogent, well-conceived and ecologically sensitive construction plans are implemented and the mitigation measures provided in this report as well as general good construction practice are adhered to, the proposed Witberg access road and associated infrastructure is considered acceptable. Authorisation by means of a Water Use Licence Application (WULA) in terms of Sections 21 (a), (c) and (i) of the National Water Act, 1998 (Act No. 36 of 1998) must be obtained from the DWS for the Witberg access road and associated infrastructure prior to the commencement of any works.

2.3.4. Impacts on Soil and Agricultural Potential

The most sensitive soil forms identified within the assessment corridor is the Bethesda, Nkonkoni and Garies soil forms. The land capability sensitivities (DAFF, 2017) indicate land capabilities with "Very low" to "Moderate" sensitivities, which correlates with the findings from the baseline assessment. The regulated area is associated with non-arable soils.

The available climate limits crop production significantly. The harsh climatic conditions are associated with low annual rainfall and high evapotranspiration potential demands of the area. The area is not favourable for most cropping practices, which corresponds to the current uses for livestock production, nature reserves and game farming.

It is the specialist's opinion that the proposed Witberg access road and associated infrastructure will have limited impact on the agricultural production ability of the land. Most available soils in the area are shallow and rocky which significantly limits most crop production. In the proposed assessment area, there are some crop fields with "High" crop field sensitivity. Such crop field sections should be considered as no-go areas for the access road, altering the alignment to avoid these areas. In the event, moving such portions is not feasible,

the stakeholders can investigate possible scenarios for the compensation of the landowners of the crop fields. The specialist recommends that, the proposed Witberg access road and associated infrastructure may be favourably considered.

2.3.5 Impacts on Heritage Resources (including archaeology and palaeontology)

The results of the heritage assessment conducted for the proposed development, largely align with the findings of Hart et al. 2012. The field assessment identified another 10 archaeological observations discussed in this report. Most of the heritage resources identified will not be directly impacted by the proposed road development. Indirect impacts are anticipated for the identified rock art site and mitigation measures in this regard are proposed below.

Direct impacts are anticipated for the stone wall identified which the proposed access road traverses. To this end, it is recommended that the proposed road alignment be amended slightly in order to ensure that limited impact to this resource takes place.

Despite the high levels of palaeontological sensitivity anticipated from the underlying geology as well as the findings of the HIA completed for the Witberg WEF, no significant palaeontological heritage resources were identified in the PIA and it was determined that the likelihood of the proposed development impacting on significant palaeontological heritage is, in reality, low.

In terms of the cultural landscape of the area, key heritage elements include the Matjiesfontein PHS, the N1 Scenic Route and the wilderness characteristics of the Moordenaars Karoo in general. The proposed road development falls within the approved Witberg WEF and as such, it is unlikely that the proposed road development will negatively impact on this unique karoo cultural landscape. Although the Witberg mountain range is visible from some distance, the nature of the road development and its location along the ridge means that the road itself is unlikely to be visible from the N1 or Matjiesfontein PHS.

There is no objection to the proposed development of the proposed road in terms of impacts to archaeological heritage on condition that:

- » A no-go buffer area of 100m must be implemented around rock art Site 002 to ensure that no indirect impact takes place. This site should also be marked as no-go on all development maps and SDPs.
- » A no-go buffer area of 50m must be implemented around Site 007 to ensure that no indirect impact takes place. This site should also be marked as no-go on all development maps and SDPs.
- » The proposed road alignment is amended to limit impact to the stone wall (Site 006) by utilising the existing gap and disturbed section of the wall and limiting the proposed new road footprint to a 10m corridor at the position where the proposed road crosses the existing stone wall.
- » A Heritage Agreement and Management Plan is developed in conjunction with HWC to ensure the ongoing conservation and management of the rock art Site 002.
- » The Chance Fossil Finds Procedure (attached as Appendix E) must be implemented for the duration of construction activities.
- » Should any buried archaeological resources or burials be uncovered during the course of development activities, work must cease in the vicinity of these finds. Heritage Western Cape (HWC) must be contacted immediately in order to determine an appropriate way forward.

Heritage Western Cape (HWC) has indicated that they are in support of these recommendations (refer to the specialist confirmation letter attached as Appendix G to the final EMPr as well as the Final comment included in Appendix C4 of the final BA report).

2.3.6. Assessment of Cumulative Impacts

The access road development is located within the authorised footprint of the Witberg Wind Farm, and ties into an existing authorised road network and is surrounded by similar linear developments. Based on the specialist cumulative assessments and findings regarding the development of the access road and its contribution to the overall impact within the surrounding area, it can be concluded that there are no cumulative impacts or risks identified as unacceptable with the development of the access road within the surrounding area.

2.3.7. Environmental Sensitivity Mapping

As part of the specialist investigations undertaken for the access road and associated infrastructure, specific environmental features and areas were identified which will be impacted by the construction of the access road. The current condition of the features identified informed the sensitivity of the environmental features and the capacity for disturbance and change associated with the proposed development. The sensitive features identified specifically relate to ecology, freshwater resources and heritage (refer to **Figure 2.3**).

- » The proposed access road and associated infrastructure will traverse numerous episodic drainage lines and ephemeral tributaries with riparian vegetation. Although these episodic drainage lines cannot be classified as rivers or streams in the traditional sense thereof due to the lack of saturated soil and riparian vegetation, they do still function as waterways, due to the episodic conveyance of water.
- » The Witberg access road traverses several watercourses at existing (proposed to be upgraded) and potentially new crossings through watercourses, particularly for the section of Witberg access road proposed to be developed from upgrading existing jeep tracks. The north-western section of the Witberg access road is located directly adjacent to an ephemeral tributary of the Kragga River system for a distance of approximately 4,5 km.
- » The entire study area is assigned a **Very High** terrestrial sensitivity by the DFFE screening tool. The very high sensitivity is attributed to the presence of a multiple Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) which are traversed by the site roads with the site camp area within a Terrestrial CBA1 zone. The presence of CBAs was confirmed for all habitat units namely the Cape Mountain Zebra and the Watercourse Habitat unit. Areas of high sensitivity were confirmed through the ecology impact assessment in the mountainous regions where the vegetation is residual high quality and where 'alpine' corridor movement in the case of the road crossing needs to be maintained between the range.
- » There are areas of **Very High** agricultural potential within the assessed corridor for the existing roads (which are to be upgraded), which is confirmed by the High Crop sensitivity. These areas are identified as no-go areas.
- » The project site traverses a historic stone wall of **High** Sensitivity.
- » Heritage buffers recommended are as follows:
 - » A no-go buffer area of 100m around rock art Site 002 to ensure that no indirect impact takes place. This site should also be marked as no-go on all development maps and SDPs.
 - » A no-go buffer area of 50m around Site 007 to ensure that no indirect impact takes place. This site should also be marked as no-go on all development maps and SDPs.

2.3.8. Overall Conclusion (Impact Statement)

The construction and operation of the access road and infrastructure associated with the authorised Witberg Wind Farm has been proposed by Red Rocket South Africa (Pty) Ltd. The need and desirability for the proposed access road is directly linked to the need of the Witberg Wind Farm (a Preferred Bidder project under a private PPA), as the main purpose of the proposed road is to support the development of the wind farm. The access road is required in addition to the authorised access roads to accommodate heavy vehicles for the delivery of heavy components and equipment for construction purposes. A newly proposed construction camp and laydown area will be required since the location of the proposed new construction camp is the most logically optimal location for the construction and operation of this access road. The assessment of the proposed access road was undertaken by independent specialists and their findings have informed the results of this EMPr.

The specialist studies have concluded that there are no environmental fatal flaws associated with the development of the access road and associated infrastructure provided that the recommended mitigation measures are implemented. The access road is considered suitable for development, provided areas of sensitivity as determined by the specialists and detailed in the Basic Assessment Report are considered and recommended mitigation implemented. All impacts associated with the access road can be mitigated to acceptable levels.

2.3.9. Overall Recommendation

Considering the findings of the independent specialist studies, the impacts identified, as well as the potential to further minimise the impacts identified to acceptable levels through mitigation, it is the reasoned opinion of the Environmental Assessment Practitioner (EAP) that the development of the access road and associated infrastructure is acceptable within the landscape and can reasonably be authorised. The recommended validity period for the environmental authorisation is 10 years.

The following key conditions would be required to be included within the environmental authorisation issued for the access road:

- » The project footprint must be minimised and must remain within the demarcated development area to avoid impacts on episodic drainage lines and SCCs in the surrounding areas.
- » The proposed road alignment must be designed to limit impact to the stone wall (Site 006) by utilising the existing gap and disturbed section of the wall and limiting the proposed new road footprint to a 10m corridor at the position where the proposed road crosses the existing stone wall.
- » A Heritage Agreement and Management Plan is developed in conjunction with HWC to ensure the ongoing conservation and management of the rock art Site 002.
- » The Chance Fossil Finds Procedure must be implemented for the duration of construction activities.
- » Should any buried archaeological resources or burials be uncovered during the course of development activities, work must cease in the vicinity of these finds. Heritage Western Cape (HWC) must be contacted immediately in order to determine an appropriate way forward.
- » The access road layout and EMPr should be approved along with the environmental authorisation (should authorisation be issued for the project).
- » All mitigation measures detailed within the BA Report, as well as the specialist reports contained within **Appendices D to G** of the BA Report, are to be implemented.

- » The updated EMPr forms part of the contract with the Contractor appointed to construct and maintain access road in order to ensure compliance with environmental specifications and management measures. The implementation of the EMPr for all life cycle phases of the access road is considered key in achieving the appropriate environmental management standards as detailed for this project.
- » A pre-construction walk-through of the access road route for species of conservation concern (SCC) that would be affected and that can be translocated must be undertaken by an ecologist prior to the commencement of the construction phase. Permits from the relevant national and provincial authorities, i.e., CapeNature and the Department of Forestry, Fisheries, and the Environment (DFFE), must be obtained before the individual species of concern are disturbed.
- » Prior to construction, a walkdown of the final road layout must be completed by an archaeologist to ensure that no significant archaeological heritage is impacted by the proposed road development¹.
- » Obtain all other environmental permits for the project, as required.

2.3 Final Layout

In accordance with the requirements of the Environmental Authorisation (EA) issued for the project, a final layout overlain on the sensitivity map has been included as part of this EMPr (refer to **Figure 2.3** overleaf). This map includes:

- » The final delineation of the proposed access road.
- » Positions of all infrastructures as approved.
- » All existing infrastructures on the site including roads.
- » Any sensitive environmental features that will be affected by the access route.
- » All "no-go" and buffer areas.

¹ Refer to specialist confirmation letter included in Appendix G confirming that this walk through is not required to be undertaken as the final alignment of the road does not differ to that assessed in the BA process.

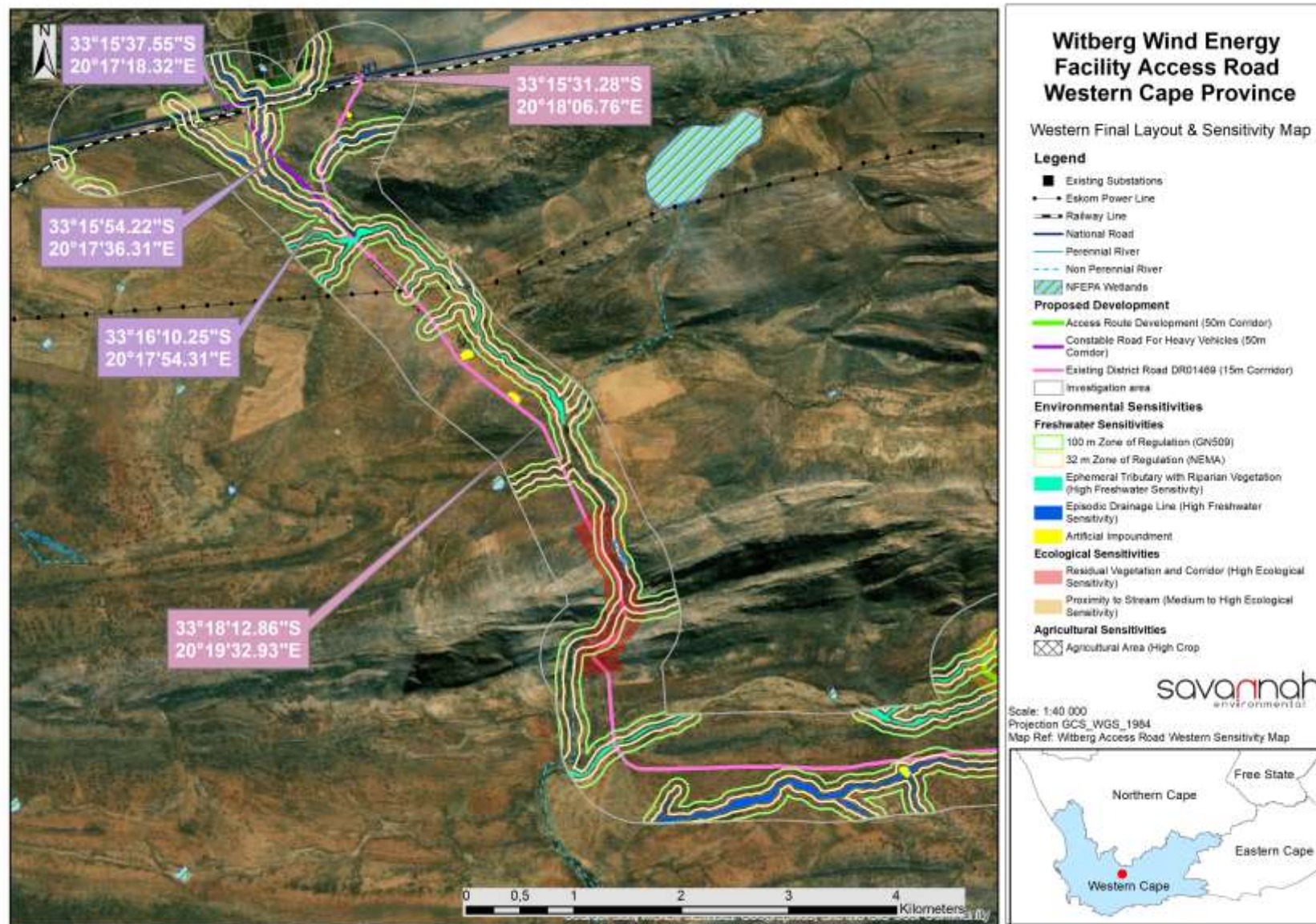


Figure 2.3a: Layout and overall environmental sensitivity maps illustrating the western section of the proposed development (existing DR01469 road and Farm Constable Road)

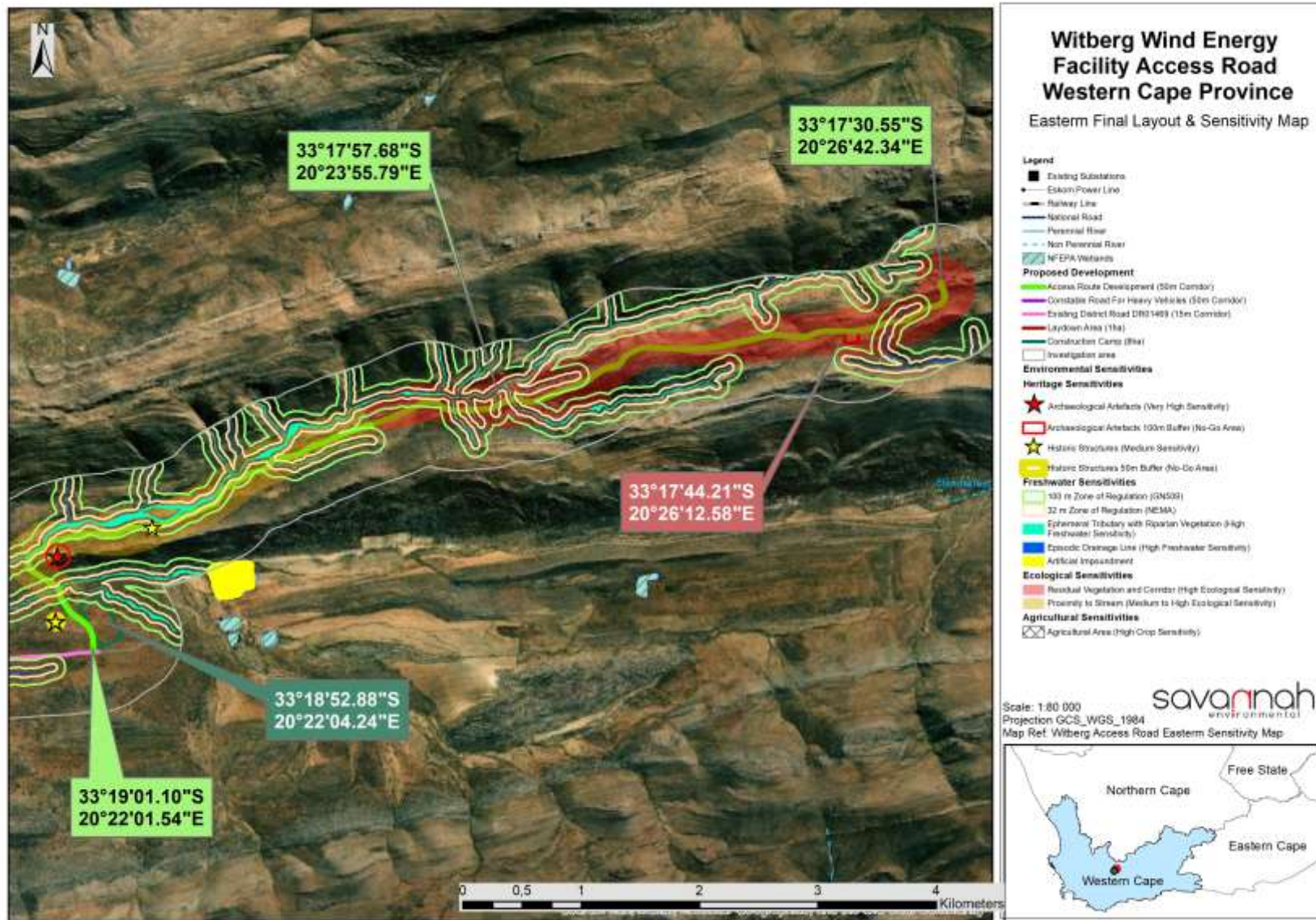


Figure 2.3b: Layout and overall environmental sensitivity maps illustrating the eastern section of the proposed development (newly proposed access road, construction camp and laydown areas)

2.4. Life-cycle Phases of the Access Road

Construction Phase	
Requirements	<p>The construction of the proposed access road will be undertaken as part of the construction for the Witberg Wind Farm.</p> <ul style="list-style-type: none"> » Duration of the construction phase of the road is expected to be approximately 6 months. » Create direct construction employment opportunities. Up to 50 employment opportunities will be created during the construction phase. » No on-site labour camps. Employees to be transported to and from housing to site daily via a local transportation company. » Construction waste will be temporarily stored on site and waste removal and sanitation will be undertaken by a sub-contractor or appointed contractor on a regular basis. » Electricity required for construction activities will be generated by a generator or will be sourced from available Eskom distribution networks in the area. » Water will be required for the construction phase and potable needs. If required, water will be sourced from the local municipality, existing borehole/s on or near the project site (subject to agreement with landowners and authorisation from DWS).
Construction sequence	<p>The access road will be undertaken in the following sequence:</p> <ul style="list-style-type: none"> » Step 1: Surveying of the development area, engaging with affected landowners, environmental specialist walkthroughs » Step 2: Final design based on geo-technical, topographical conditions and potential environmental sensitivities » Step 3: Vegetation clearance and the construction of the road » Step 4: Rehabilitation of disturbed areas » Step 5: Continued maintenance
Activities to be undertaken	
Conduct surveys prior to construction	<ul style="list-style-type: none"> » Including, but not limited to: a geotechnical survey, final environmental walkthroughs, site survey (including the final location of the development footprint) of access road.
Undertake site preparation	<ul style="list-style-type: none"> » Including the clearance of vegetation. » Stripping of topsoil to be stockpiled, backfilled, removed from site and/or spread on site. » To be undertaken in a systematic manner to reduce the risk of exposed ground being subjected to erosion. » Include search and rescue for identified species of concern before construction.
Infrastructure construction	<ul style="list-style-type: none"> » Construction of the access road. » Construction of the construction camp and laydown area.
Undertake site rehabilitation	<ul style="list-style-type: none"> » Commence with rehabilitation efforts once construction is completed in an area, and all construction equipment is removed.
Operation Phase	
Requirements	<ul style="list-style-type: none"> » Duration will be 20 years, or longer as needed for the operation of the Witberg Wind Farm. » Requirements for maintenance of access road.

Activities to be undertaken

Operation and Maintenance	<ul style="list-style-type: none">» Ad hoc road maintenance activities.» On-going rehabilitation of those areas which were disturbed during the construction phase.» During this operation phase vegetation surrounding the road will require management only if it impacts on the safety and operational objectives of the project.
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Decommissioning Phase

Requirements	<ul style="list-style-type: none">» Decommissioning of the access road and associated infrastructure for the Witberg Wind Farm will occur at the end of the economic life of the wind farm.» Decommissioning activities to comply with the legislation relevant at the time.» Requirement for rehabilitation of disturbed area
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CHAPTER 3: PURPOSE AND OBJECTIVES OF THE EMPr

An Environmental Management Programme (EMPr) is defined as “an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented or mitigated, and that the positive benefits of the projects are enhanced”. The objective of this EMPr is to provide consistent information and guidance for implementing the management and monitoring measures established in the permitting process and help achieve environmental policy goals. The purpose of an EMPr is to help ensure continuous improvement of environmental performance, reducing negative impacts and enhancing positive effects during the construction and operation of the access road and associated infrastructure. An effective EMPr is concerned with both the immediate outcome as well as the long-term impacts of the project.

The EMPr provides specific environmental guidance for the construction and operation phases of a project and is intended to manage and mitigate construction and operation activities so that unnecessary or preventable environmental impacts do not result. These impacts range from those incurred during start up (site clearing and site establishment) through to those incurred during the construction activities themselves (erosion and dust) to those incurred during site rehabilitation (soil stabilisation, re-vegetation) and operation. The EMPr also defines monitoring requirements in order to ensure that the specified objectives are met.

This EMPr is applicable to all employees and contractors working on the pre-construction, construction, and operation and maintenance phases of the project. The document must be adhered to and updated as relevant throughout the project life cycle.

This EMPr has been compiled in accordance with Appendix 4 of the EIA Regulations, 2014 (as amended) and the requirements of the EA issued for the project. This is a dynamic document and will be further developed in terms of specific requirements listed in any authorisations issued for the proposed project and/or as the project develops. This will ensure that the construction and operation activities are planned and implemented taking sensitive environmental features into account. The EMPr has been developed as a set of environmental specifications (i.e. principles of environmental management), which are appropriately contextualised to provide clear guidance in terms of the on-site implementation of these specifications (i.e. on-site contextualisation is provided through the inclusion of various monitoring and implementation tools).

The EMPr has the following objectives:

- » Outline mitigation measures and environmental specifications which are required to be implemented for the planning, construction, rehabilitation and operation phases of the project in order to minimise the extent of environmental impacts, and to manage environmental impacts associated with the access road and associated infrastructure.
- » Ensure that the construction and operation phases do not result in undue or reasonably avoidable adverse environmental impacts and ensure that any potential environmental benefits are enhanced.
- » Identify entities who will be responsible for the implementation of the measures and outline functions and responsibilities.
- » Propose mechanisms and frequency for monitoring compliance and prevent long-term or permanent environmental degradation.
- » Facilitate appropriate and proactive responses to unforeseen events or changes in project implementation that were not considered in the BA process.

The mitigation measures identified within the BA process are systematically addressed in the EMPr, ensuring the minimisation of adverse environmental impacts to an acceptable level.

The Developer must ensure that the implementation of the project complies with the requirements of all environmental authorisations, permits, and obligations emanating from relevant environmental legislation. This obligation is partly met through the development and the implementation of this EMPr, and through its integration into the relevant contract documentation provided to parties responsible for construction and/or operation activities on the site. Since this EMPr is part of the BA process for the project, it is important that this document be read in conjunction with the BA Report compiled for this project. This will contextualise the EMPr and enable a thorough understanding of its role and purpose in the integrated environmental management process. Should there be a conflict of interpretation between this EMPr and the Environmental Authorisation, the stipulations in the Environmental Authorisation shall prevail over that of the EMPr, unless otherwise agreed by the authorities in writing. Similarly, any provisions in legislation overrule any provisions or interpretations within this EMPr.

This EMPr shall be binding on all the parties involved in the planning, construction and operational phases of the project, and shall be enforceable at all levels of contract and operational management within the project. The document must be adhered to and updated as relevant throughout the project life cycle.

CHAPTER 4: STRUCTURE OF THIS EMPr

The preceding chapters provide background to the EMPr and the proposed project, while the chapters which follow consider the following:

- » Planning and design activities;
- » Construction activities;
- » Operation activities; and
- » Decommissioning activities.

These chapters set out the procedures necessary for the project owner to minimise environmental impacts and achieve environmental compliance. For each of the phases of implementation for the project, an overarching environmental **goal** is stated. In order to meet this goal, a number of **objectives** are listed. The management programme has been structured in table format in order to show the links between the goals for each phase and their associated objectives, activities/risk sources, mitigation actions, monitoring requirements and performance indicators. A specific EMPr table has been established for each environmental objective. The information provided within the EMPr table for each objective is illustrated below:

OBJECTIVE: Description of the objective, which is necessary to meet the overall goals; which take into account the findings of the specialist studies

Project Component/s	List of project components affecting the objective, i.e.: <ul style="list-style-type: none"> » New Access Road. » Upgrade of Existing District Road DR01469 » Widening and Upgrade of Constable and Supporting Constable Farm Roads » Construction camp and laydown area
Potential Impact	Brief description of potential environmental impact if objective is not met.
Activity/Risk Source	Description of activities which could affect achieving the objective.
Mitigation: Target/Objective	Description of the target and/or desired outcomes of mitigation.

Mitigation: Action/Control	Responsibility	Timeframe
List specific action(s) required to meet the mitigation target/objective described above.	Who is responsible for the measures	Time periods for implementation of measures

Performance Indicator	Description of key indicator(s) that track progress/indicate the effectiveness of the management programme.
Monitoring	Mechanisms for monitoring compliance; the key monitoring actions required to check whether the objectives are being achieved, taking into consideration responsibility, frequency, methods, and reporting.

The objectives and EMPr tables are required to be reviewed and possibly modified whenever changes, such as the following, occur:

- » Planned activities change (i.e. in terms of the components and/or layout of the access road);
- » Modification to or addition to environmental objectives and targets;
- » Additional or unforeseen environmental impacts are identified and additional measures are required to be included in the EMPr to prevent deterioration or further deterioration of the environment.
- » Relevant legal or other requirements are changed or introduced; and
- » Significant progress has been made on achieving an objective or target such that it should be re-examined to determine if it is still relevant, should be modified, etc.

4.1 Contents of this Environmental Management Programme (EMPr)

This Environmental Management Programme (EMPr) has been prepared as part of the BA process being conducted in support of the application for Environmental Authorisation (EA) for the access road. This EMPr has been prepared in accordance with the requirements of Appendix 4 of the 2014 EIA Regulations (as amended, GNR 326). It provides recommended management and mitigation measures with which to minimise impacts and enhance benefits associated with the project.

An overview of the contents of this EMPr, as prescribed by Appendix 4 of the 2014 EIA Regulations, as amended (GNR 326), and where the corresponding information can be found within this EMPr is provided in Table 4.1.

Table 4.1: Summary of where the requirements of Appendix 4 of the 2014 NEMA EIA Regulations (GNR 326) are provided in this EMPr.

Requirement	Location in this EMPr
(1) An EMPr must comply with section 24N of the Act and include –	
(a) Details of –	Chapter 4 Appendix B
(i) The EAP who prepared the EMPr.	
(ii) The expertise of that EAP to prepare an EMPr, including a curriculum vitae.	
(b) A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description.	Chapter 2
(c) A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers.	Chapter 2 Figure 2.3
(d) A description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including –	
(i) Planning and design.	Chapter 5
(ii) Pre-construction activities.	Chapter 5
(iii) Construction activities.	Chapter 6
(iv) Rehabilitation of the environment after construction and where applicable post closure.	Chapter 7
(v) Where relevant, operation activities.	Chapter 8
(f) A description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable, include actions to –	
(i) Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation.	Chapters 5 - 8

Requirement	Location in this EMPr
(ii) Comply with any prescribed environmental management standards or practices. (iii) Comply with any applicable provisions of the Act regarding closure, where applicable. (iv) Comply with any provisions of the Act regarding financial provision for rehabilitation, where applicable.	
(g) The method of monitoring the implementation of the impact management actions contemplated in paragraph (f).	Chapters 5 - 8
(h) The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f).	Chapters 5 - 8
(i) An indication of the persons who will be responsible for the implementation of the impact management actions.	Chapters 5 - 8
(j) The time periods within which the impact management actions contemplated in paragraph (f) must be implemented.	Chapters 5 - 8
(k) The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f).	Chapters 5 - 8
(l) A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations.	Chapter 6
(m) An environmental awareness plan describing the manner in which – (i) The applicant intends to inform his or her employees of any environmental risk which may result from their work. (ii) Risks must be dealt with in order to avoid pollution or the degradation of the environment.	Chapter 6
(n) Any specific information that may be required by the competent authority.	N/A
(2) Where a government notice gazetted by the Minister provides for a generic EMPr, such generic EMPr as indicated in such notice will apply.	N/A

4.2 Project Team

In accordance with Regulation 12 of the 2014 EIA Regulations (GNR 326) the applicant appointed Savannah Environmental (Pty) Ltd as the independent environmental consultants responsible for managing the application for EA and the supporting BA process. The application for EA and the BA process, is being managed in accordance with the requirements of NEMA, the 2014 EIA Regulations (GNR 326), and all other relevant applicable legislation.

4.2.1 Details and Expertise of the Environmental Assessment Practitioner (EAP)

Savannah Environmental is a leading provider of integrated environmental and social consulting, advisory and management services with considerable experience in the fields of environmental assessment and management. The company is wholly woman-owned (51% black woman-owned) and is rated as a Level 2 Broad-Based Black Economic Empowerment (B-BBEE) Contributor. The company was established in 2006 with a clear objective to provide services to the infrastructure development sector. Savannah Environmental benefits from the pooled resources, diverse skills and experience in the environmental field held by its team that has been actively involved in undertaking environmental studies for a wide variety of projects throughout South Africa and neighbouring countries. Strong competencies have been developed in project management of environmental processes, as well as strategic environmental assessment and compliance advice, and the assessment of environmental impacts, the identification of environmental management solutions and mitigation/risk minimising measures.

This BA process is being managed by Jo-Anne Thomas. She is supported by Chantelle Geyer and Nicolene Venter.

- » **Jo-Anne Thomas.** She holds a Master of Science Degree in Botany (M.S.c Botany) from the University of the Witwatersrand and is registered as a Professional Natural Scientist (400024/2000) with SACNASP and a registered Environmental Assessment Practitioner (EAP) with EAPASA (2019/726). She has over 24 years of experience in the field of environmental assessment and management, and the management of large environmental assessment and management projects. During this time, she has managed and coordinated a multitude of large-scale infrastructure EIAs and is also well versed in the management and leadership of teams of specialist consultants, and dynamic stakeholders. She has been responsible for providing technical input for projects in the environmental management field, specialising in Strategic Environmental Advice, EIA studies, environmental permitting, public participation, EMPs and EMPrs, environmental policy, strategy and guideline formulation, and integrated environmental management (IEM). Her responsibilities for environmental studies include project management, review and integration of specialist studies, identification and assessment of potential negative environmental impacts and benefits, and the identification of mitigation measures, and compilation of reports in accordance with applicable environmental legislation.
- » **Chantelle Geyer,** the author of the BA Report and EMPr, holds a BSc degree in Environmental Science, and a BSc Honours degree in Environmental Geology degree from the North-West University in Potchefstroom, South Africa. She is a Junior Environmental Consultant and specialises in basic assessments, environmental impact assessments, GIS-mapping, public participation administration, environmental management programmes, and environmental compliance.

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

Curricula Vitae (CVs) detailing the Savannah Environmental team's expertise and relevant experience are provided in **Appendix B** of the EMPr.

4.2.2 Details of the Specialist Consultants

A number of independent specialist consultants have been appointed as part of the BA project team in order to adequately identify and assess potential impacts associated with the project (refer to **Table 4.1**). The specialist consultants have provided input into the BA Report as well as this EMPr.

Table 4.1: Specialist Consultants which form part of the EIA project team.

Specialist Area of Expertise	Specialist Company
Ecology	NCC Environmental Services (Pty) Ltd
Freshwater	FEN Consulting
Soils and Agricultural Potential Impact Assessment	The Biodiversity Company
Heritage (Archaeology and Palaeontology)	CTS Heritage

CHAPTER 5: PLANNING AND DESIGN MANAGEMENT PROGRAMME

Overall Goal: undertake the pre-construction activities (planning and design phase) in a way that:

- » Ensures that the preferred design and layout of the access road and associated infrastructure responds to the identified environmental constraints and opportunities.
- » Ensures that pre-construction activities are undertaken in accordance with all relevant legislative requirements.
- » Ensures that adequate regard has been taken of any landowner and community concerns and that these are appropriately addressed through design and planning (where appropriate).
- » Enables the construction activities to be undertaken without significant disruption to other land uses and activities in the area.

In order to meet this goal, the following objectives have been identified, together with necessary actions and monitoring requirements.

5.1 Objectives

OBJECTIVE 1: Ensure the access road and associated infrastructure design responds to identified environmental constraints and opportunities

The sensitivities as detailed in the Basic Assessment Report and reflected in **Figure 2.3** must be considered during the final design of the access road.

Project Component/s	<ul style="list-style-type: none"> » New Access Road. » Upgrade of Existing District Road DR01469 » Widening and Upgrade of Constable and Supporting Constable Farm Roads » Construction camp and laydown area
Potential Impact	» Impact on identified sensitive areas.
Activities/Risk Sources	<ul style="list-style-type: none"> » Positioning of all project components » Pre-construction activities (site surveys and environmental walk-through surveys)
Mitigation: Target/Objective	» Site sensitivities are taken into consideration and avoided as far as possible, thereby mitigating potential impacts.

Mitigation: Action/Control	Responsibility	Timeframe
Plan and conduct pre-construction activities in an environmentally acceptable manner.	Developer Contractor	Pre-construction
It is imperative that all construction works be planned to be undertaken during periods of low to no rainfall (thus preferably during the dry, winter months) when the flow/level of water is very low in the watercourses.	Developer Contractor	Pre-construction
Culvert crossings must be designed to ensure that the structures are geotechnically sound and that they are hydraulically stable, even if a 1:100 year flood event was to occur. The designs should include	Developer Design contractor	Design

Mitigation: Action/Control	Responsibility	Timeframe
culverts installed intermittently to ensure a free draining landscape. It is recommended that a suitably qualified hydrologist be consulted to provide guidance on the relevant sizes and width requirements to ensure that hydraulic functioning of the system is maintained.		
The crossings must be designed such that should they be overtopped, they remain stable and do not lead to excessive downstream erosion and incision	Developer Design contractor	Design
A freshwater ecologist must ensure that the final design accounts for appropriate wetting frequencies and patterns are maintained in the pre-development condition.	Developer Specialist	Pre-construction
Ensure that no clearing or stockpiling occurs within the episodic drainage lines and possible buffer zones as defined by the freshwater specialists	Developer Contractor	Construction
The delineated extent of the episodic drainage line must be clearly demarcated with danger tape as a 'no-go area' by an Environmental Control Officer (ECO). No construction personnel and equipment/vehicles may enter the episodic drainage line	Developer Contractor	Construction
A no-go buffer area of 100m must be implemented around rock art Site 002 to ensure that no indirect impact takes place. This site should also be marked as no-go on all development maps and SDPs.	Developer Contractor	Design
A no-go buffer area of 50m must be implemented around Site 007 to ensure that no indirect impact takes place. This site should also be marked as no-go on all development maps and SDPs.	Developer Contractor	Design
The proposed road alignment is amended to limit impact to the stone wall (Site 006) by utilising the existing gap and disturbed section of the wall and limiting the proposed new road footprint to a 10m corridor at the position where the proposed road crosses the existing stone wall.	Developer Contractor	Design
High crop field sensitivity sections should be considered as no-go areas for the access road, altering the alignment to avoid these areas. In the event, moving such portions is not feasible, the stakeholders can investigate possible scenarios for the compensation of the landowners of the crop fields.	Developer Contractor	Pre-construction Construction
<u>Botanical search and rescue need to be undertaken according to best practices and species relocated into similar environments as before as per the criteria outlined in the IUCN Guidelines for Reintroductions and other Conservation Translocations (IUCN/SSC 2013) (i.e.: If a plant is moved from a rocky patch it needs to be planted in a similar rocky patch) (Refer to Section 9 of the walk-through report contained in Appendix C for Botanical Search and Rescue Principles).</u>	<u>Developer</u> <u>Contractor</u> <u>Specialist</u>	<u>Pre-construction</u> <u>Construction</u>

Performance Indicator	<ul style="list-style-type: none"> » The design meets the objectives and does not degrade the environment. » Demarcated sensitive areas are avoided at all times. » Design and layouts respond to the mitigation measures and recommendations in the BA Report.
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Monitoring	<ul style="list-style-type: none"> » Review of the design by the Project Manager and the Environmental Control Officer (ECO) <u>and/or the Environmental Site Compliance Officer (ESCO)</u> prior to the commencement of construction. » Monitor ongoing compliance with the FMP and method statements.
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OBJECTIVE 2: Ensure that relevant permits and plans are in place to manage impacts on the environment

Project Component/s	<ul style="list-style-type: none"> » New Access Road. » Upgrade of Existing District Road DR01469 » Widening and Upgrade of Constable and Supporting Constable Farm Roads » Construction camp and laydown area
Potential Impact	» Impact on identified sensitive areas and protected species.
Activities/Risk Sources	» Pre-construction activities (environmental walk-through surveys).
Mitigation: Target/Objective	<ul style="list-style-type: none"> » To ensure that pre-construction activities are undertaken in an environmentally friendly manner. » To ensure that the design of the access road and associated infrastructure responds to the identified constraints identified through pre-construction surveys.

Mitigation: Action/Control	Responsibility	Timeframe
Obtain any additional environmental permits required prior to the commencement of construction. Copies of permits/licenses must be submitted to the Director: Environmental Impact Evaluation at the DFFE.	Developer	Pre-construction
Affected individuals of selected protected species (i.e. those that are of high conservation value or which have a high probability of surviving translocation) which cannot be avoided should be translocated to a safe area on the site prior to construction. This does not include woody species which cannot be translocated and where these are protected, a permit for their destruction would be required. <u>The suitable species list for botanical search and rescue permit application is provided in Section 14 of the walk-through report contained in Appendix C.</u>	Developer Contractor Specialist	Pre-construction
A Heritage Agreement and Management Plan must be developed in conjunction with HWC to ensure the ongoing conservation and management of the rock art Site 002 (<u>refer to Appendix D</u>).	Developer Contractor Specialist	Pre-construction
A chance find procedure must be developed and implemented in the event that archaeological or palaeontological resources are found (<u>refer to Appendix A</u>).	Developer Contractor	Pre-construction
An Ecological walkdown of the footprint area is required before construction activities can commence, where all anticipated floral SCC are searched for and marked. Wherever possible micro-siting must take place to avoid SCC, and especially SCC which cannot be rescued and relocated.	Developer Contractor Specialist	Pre-construction
Wherever possible micro-siting must take place to avoid SCC, and especially SCC which cannot be rescued and relocated. An	Developer Contractor	Pre-construction

Mitigation: Action/Control	Responsibility	Timeframe
assessment must be undertaken to determine those that are eligible for relocation and/or destruction so that all necessary permits and authorisations can be obtained from authorities.	Specialist	
<u>A permit must be obtained from the relevant nature conservation agency for the removal or destruction of protected or endangered plant or animal species. The suitable species list for botanical search and rescue permit application is provided in Section 14 of the walk-through report contained in Appendix C.</u>	<u>Developer</u> <u>Contractor</u> <u>Specialist</u>	<u>Pre-construction</u>
Develop an alien vegetation management plan be compiled during the planning phase.	Contractor	Planning
<u>Should the alignment change significantly from that assessed in the BA process, a walkdown of the final road layout must be completed prior to construction by an archaeologist to ensure that no significant archaeological heritage is impacted by the proposed road development.</u>	<u>Developer</u> <u>Contractor</u> <u>Specialist</u>	<u>Pre-construction</u>
<u>No activities will be allowed to encroach into a water resource without a water use authorisation being in place from the Department of Water and Sanitation.</u>	<u>Developer</u> <u>Contractor</u>	<u>Pre-construction</u>

Performance Indicator	<ul style="list-style-type: none"> » Permits are obtained and relevant conditions complied with. » Impact on protected plant species reduced to some degree through Search and Rescue. » Relevant management plans and Method Statements prepared and implemented.
Monitoring	<ul style="list-style-type: none"> » Review of the design by the Project Manager and the Environmental Control Officer (ECO) <u>and/or the Environmental Site Compliance Officer (ESCO)</u> prior to the commencement of construction. » Monitor ongoing compliance with the EMP and method statements.

OBJECTIVE 4: Ensure appropriate planning is undertaken by contractors

Project Component/s	<ul style="list-style-type: none"> » New Access Road. » Upgrade of Existing District Road DR01469 » Widening and Upgrade of Constable and Supporting Constable Farm Roads » Construction camp and laydown area
Potential Impact	» Impact on identified sensitive areas.
Activities/Risk Sources	» Pre-construction activities.
Mitigation: Target/Objective	<ul style="list-style-type: none"> » To ensure that the design of the access road and associated infrastructure responds to the identified environmental constraints and opportunities. » To ensure that pre-construction activities are undertaken in an environmentally friendly manner.

Mitigation: Action/Control	Responsibility	Timeframe
The terms of this EMPr and the Environmental Authorisation must be included in all tender documentation and Contractors contracts.	Developer Contractor	Pre-construction
Pre-construction environmental induction for all construction staff on site must be provided to ensure that basic environmental principles are adhered to. This includes awareness of no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimising wildlife interactions, remaining within demarcated construction areas etc.	EO	Pre-construction

Performance Indicator	» Conditions of the EMPr form part of all contracts.
Monitoring	» Local employment and procurement is encouraged.
	» Monitor ongoing compliance with the EMP and method statements.

CHAPTER 6: MANAGEMENT PROGRAMME: CONSTRUCTION

Overall Goal: Undertake the construction phase in a way that:

- » Ensures that construction activities are appropriately managed in respect of environmental aspects and impacts.
- » Enables construction activities to be undertaken without significant disruption to other land uses and activities in the area, in particular concerning noise impacts, farming practices, traffic and road use, and effects on local residents.
- » Minimises the impact on the indigenous natural vegetation, and habitats of ecological value.
- » Minimises impacts on fauna (including birds) in the study area.
- » Minimises the impact on heritage sites should they be uncovered.
- » Establish an environmental baseline during construction activities on the site, where possible.

6.1 Institutional Arrangements: Roles and Responsibilities for the Construction Phase

As the proponent, Red Rocket South Africa (Pty) Ltd must ensure that the project complies with the requirements of all environmental authorisations and permits, and obligations emanating from other relevant environmental legislation. This obligation is partly met through the development of the EMPr, and the implementation of the EMPr through its integration into the contract documentation. The Developer will retain various key roles and responsibilities during the construction phase.

OBJECTIVE 1: Establish clear reporting, communication, and responsibilities in relation to the overall implementation of the EMPr

Responsible persons: Effective environmental management during the construction phase will be dependent on several project personnel. The purpose of this section is to define roles for personnel and to detail their respective responsibilities in the execution of the EMPr.

Formal responsibilities are necessary to ensure that key procedures are executed. It is important to note that the Developer, as the holder of the Environmental Authorisation, remains responsible for all aspects relating to environmental management, regardless of whether such functions and responsibilities are delegated or deferred to other parties. The Owner's compliance management structure will be set up as detailed in Figure 6.1, and Owner will have oversight of all activities to ensure compliance with the EMPr and responsible environmental practice.

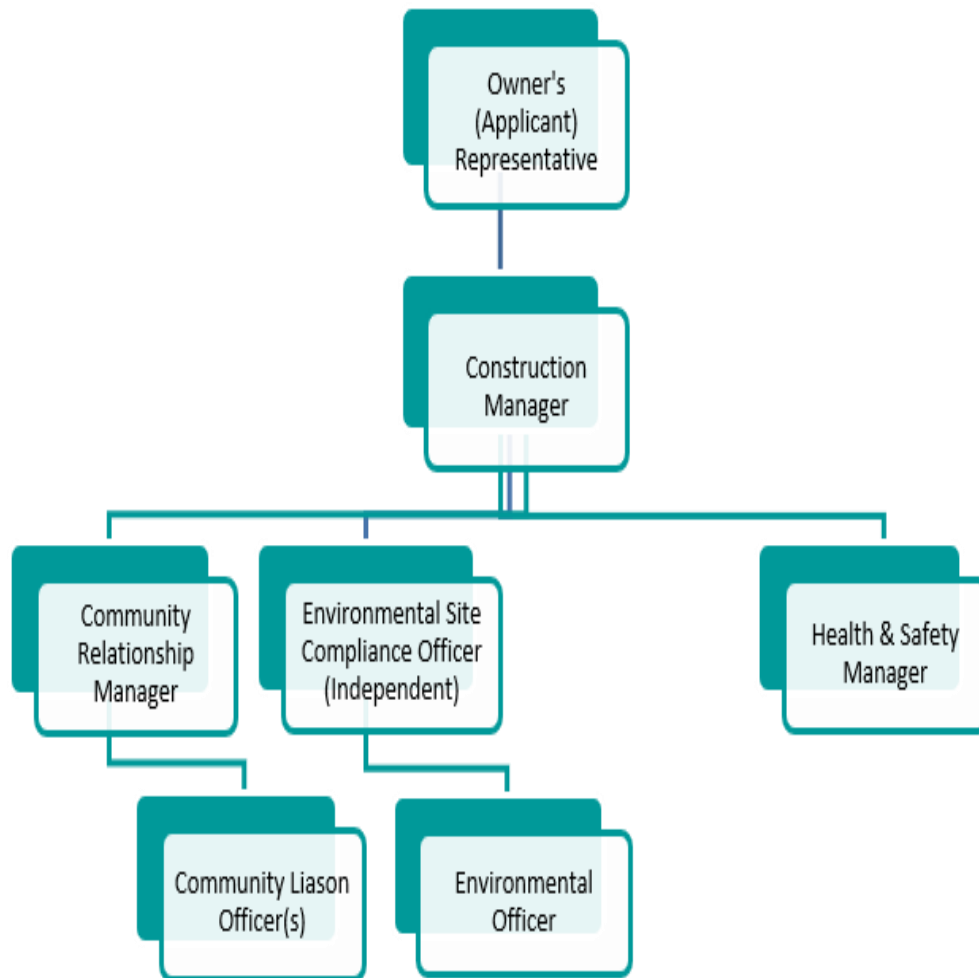


Figure 6.1: Owner's compliance management structure

Developer/Owner: The developer refers to the holder of the Environmental Authorisation who will be responsible for the following tasks, but not limited to:

- » Ensure that the requirements as set out in this EMPr are adhered to and implemented;
- » Allocate the responsibilities assigned to the ECO and/or ESCO to an independent suitably qualified individual prior to the start of construction activities on site; and
- » Provide all principal contractors working on the project with a copy of this EMPr as part of tender contract documentation to allow the contractors to cost for its requirements within their respective construction contracts.

Construction Manager: The Construction Manager / Construction Manager is responsible for ensuring that the contract is carried out to completion on time, in budget and that each Contractor fulfils his obligations in terms of conditions contained in the Environmental Authorisation. The Construction Manager will:

- » Ensure all specifications and legal constraints specifically with regards to the environment are highlighted to the Contractor(s) so that they are aware of these.
- » Ensure that the Developer and its Contractor(s) are made aware of all stipulations within the EMPr.
- » Ensure that the EMPr is correctly implemented throughout the project by means of site inspections and meetings. This will be documented as part of the site meeting minutes through input from the independent ECO and/or ESCO.
- » Be fully conversant with the EIA for the project, the EMPr, the conditions of the Environmental Authorisation, and all relevant environmental legislation.

- » Be fully knowledgeable with the contents of all relevant licences and permits.

Site Manager (The Contractor's on-site Representative) will:

- » Be fully knowledgeable with the contents of the BA.
- » Be fully knowledgeable with the contents and conditions of the Environmental Authorisation.
- » Be fully knowledgeable with the contents of the EMPr.
- » Be fully knowledgeable with the contents of all relevant environmental legislation, and ensure compliance with these.
- » Have overall responsibility of the EMPr and its implementation.
- » Conduct audits to ensure compliance to the EMPr.
- » Ensure there is communication with the Technical Director, the ECO and/or ESCO, the Internal Environmental Officer and relevant discipline engineers on matters concerning the environment.
- » Be fully knowledgeable with the contents of all relevant licences and permits.
- » Ensure that no actions are taken which will harm or may indirectly cause harm to the environment, and take steps to prevent pollution on the site.
- » Confine activities to the demarcated construction site.

Environmental Control Officer (ECO): The Developer shall appoint a suitably qualified independent ECO to monitor the compliance of all parties in terms of this EMPr and the conditions contained in the Environmental Authorisation, as well as address environmental site issues. The ECO shall work with the Owners teams and Contractor's appointed EO. The designation is reserved for a suitably qualified (National Diploma / Degree in Natural Science or an equivalent qualification), independent, environmental manager, with adequate environmental knowledge to understand and verify implementation of the EMPr. The duties of the ECO during construction phase will include but are not limited to:

- » Liaison with the Owner, Project Manager, ESCO or Construction Manager and DEA&DP.
- » Monitoring of all the Contractor's activities for compliance with the various environmental requirements contained in the construction Specification.
- » Monitoring of compliance with the Environmental Authorisation related to the construction phase as issued by DEA&DP as well as other relevant environmental legislation.
- » Reviewing of the Contractor's environmental Method Statements for compliance with the EMPr and environmental best practice.
- » Monitor and report on requisite remedial action taken in the event of non-compliance.
- » Monitor and report on the proactive and effective implementation and management of environmental protection measures.
- » Monitor and report on the register of public complaints, confirming that it is maintained by the Contractor and that all public comments or issues are appropriately reported and addressed.
- » Routine recording and reporting of environmental activities and general progress monthly.
- » Recording and reporting of environmental incidents and remediation; and
- » Monitor compliance with and implementation of the construction phase EMPr, Operational Phase EMPr and Rehabilitation Plan, including compliance with the relevant conditions contained in the Environmental Authorisation.

Environmental Site Compliance Officer (ESCO): The Developer shall appoint a suitably qualified independent ESCO to oversee on-site compliance management and EMPr implementation on a day-to-day basis. The duties of the ESCO will include but are not limited to:

- » Be fully conversant with the BAR, the conditions of EA and the EMPr;
- » Be fully conversant with all relevant environmental legislation and ensure compliance thereof;
- » Approve method statements (co-approval with Site Manager);
- » Remain employed until the completion of the construction activities; and
- » Report to the Project Manager, including all findings identified onsite
- » Undertake monthly inspections of the site and surrounding areas to audit compliance with the EMPr and conditions of the environmental authorisation;
- » Take appropriate action if the specifications contained in the EMPr and conditions of the environmental authorisation are not followed;
- » Monitor and verify that environmental impacts are kept to a minimum, as far as possible; and
- » Ensure that activities onsite comply with all relevant environmental legislation

Environmental Auditor (EA): An independent Environmental Auditor must be appointed by the Owner to undertake an Environmental Audit every five years to verify compliance with the Conditions of EA and the EMPr and submit the results to the DFFE Director: Compliance Monitoring. Audit reports must comply with Appendix 78 of the NEMA. In addition to the five yearly audits, the Owner must ensure an Audit is completed and submitted to the DFFE within 30 days of the completion of the construction phase (Refer to condition 31 of the EA).

Contractor's EO: The Contractor must ensure that all its sub-contractors, employees, etc., are made fully aware of the environmental issues detailed in this EMPr. The Contractor shall liaise closely with the Construction Manager / Construction Manager, Environmental Site Compliance Officer (ESCO) and the ECO and must ensure that all activities on site are conducted in an environmentally responsible manner and in compliance with the requirements of the EMPr and conditions of EA. The Contractor shall appoint a suitably senior member or staff or qualified professional to the position of EO. The EO's duties will include the following:

- » Liaise with all parties on matters relating to the environment;
- » Assist with the compilation of environmental components of method statements;
- » Undertake daily site compliance inspections of the various works areas;
- » Compile a weekly report detailing the key findings and environmental matters observed and dealt with during the week and submit this to the ECO, ESCO and Construction Manager;
- » Ensure Contractor is implementing the EMPr and conditions of Authorisation;
- » Ensure that any environmental monitoring requirements are being fulfilled and include results in the weekly submissions;
- » Report environmental accidents and incidents and oversee all remediated works;
- » Make recommendations for disciplinary actions where and if required; and
- » Undertake environmental awareness training and routine toolbox talks with contractor staff on matters relating to environmental management.

Contractors and Service Providers: It is important that Contractors are aware of the responsibilities in terms of the relevant environmental legislation and the contents of this EMPr. The Contractor must appoint an Internal Environmental Officer (EO) who will be responsible for informing contractor employees and sub-contractors of their environmental obligations in terms of the environmental specifications, and for ensuring that employees are adequately experienced and properly trained in order to execute the works in a manner that will minimise environmental impacts. The Internal Environmental Officer and Contractor's obligations in this regard include the following:

- » Must be fully knowledgeable on all environmental features of the construction site and the surrounding environment.
- » Be fully knowledgeable with the contents and the conditions of the Environmental Authorisation.
- » Be fully knowledgeable with the contents with the EMPr.
- » Be fully knowledgeable of all the licences and permits issued for the site.
- » Ensure a copy of the Environmental Authorisation and EMPr is easily accessible to all on-site staff members.
- » Ensure contractor employees are familiar with the requirements of this EMPr and the environmental specifications as they apply to the construction of the proposed access road.
- » Ensure that prior to commencing any site works, all contractor employees and sub-contractors must have attended environmental awareness training included in the induction training which must provide staff with an appreciation of the project's environmental requirements, and how they are to be implemented.
- » Ensure that any complaints received from the public are duly recorded and forwarded to the Site Manager and Contractor.
- » Manage the day-to-day on-site implementation of this EMPr, and the compilation of regular (usually weekly) Monitoring Reports.
- » Keep record of all activities on site, problems identified, transgressions noted and a task schedule of tasks undertaken, including those of the Independent ECO and/or ESCO.
- » Inform staff of the environmental issues as deemed necessary by the Independent ECO and/or ESCO.

All contractors (including sub-contractors and staff) and service providers are ultimately responsible for:

- » Ensuring adherence to the environmental management specifications.
- » Ensuring that Method Statements are submitted to the Site Manager (and ECO and/or ESCO) for approval before any work is undertaken.
- » Ensuring that any instructions issued by the Site Manager on the advice of the ECO and/or ESCO are adhered to.
- » Ensuring that a report is tabled at each site meeting, which will document all incidents that have occurred during the period before the site meeting.
- » Ensuring that a register is kept in the site office, which lists all transgressions issued by the ECO and/or ESCO.
- » Ensuring that a register of all public complaints is maintained.
- » Ensuring that all employees, including those of sub-contractors, receive training before the commencement of construction in order for the sub-contractors to constructively contribute towards the successful implementation of the EMPr (i.e. ensure their staff are appropriately trained on the environmental obligations).

6.2 Objectives

In order to meet the overall goal for construction, the following objectives, actions, and monitoring requirements have been identified.

OBJECTIVE 2: Minimise impacts related to inappropriate site establishment and management of construction site

Project Component/s	<ul style="list-style-type: none">» New Access Road.» Upgrade of Existing District Road DR01469
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	<ul style="list-style-type: none"> » Widening and Upgrade of Constable and Supporting Constable Farm Roads » Construction camp and laydown area
Potential Impact	<ul style="list-style-type: none"> » Damage to indigenous natural vegetation. » Loss of threatened plant species. » The potential scarring of the landscape due to vegetation clearing and resulting erosion. » Altering surface runoff patterns and potential backfill material entering the watercourses.
Activities/Risk Sources	<ul style="list-style-type: none"> » Removal of vegetation and topsoil and associated stockpiling; » Movement of construction vehicles in the area and on-site. » Mixing and casting of concrete for construction purposes; » Backfilling of excavated and disturbed areas;
Mitigation: Target/Objective	<ul style="list-style-type: none"> » No loss of or damage to sensitive vegetation in areas outside the immediate development footprint. » Intact vegetation cover outside of the immediate construction work areas. » Excavated areas restored with genetically appropriate species following the completion of construction.

Mitigation: Action/Control	Responsibility	Timeframe
Ensure that no activities infringe on identified no-go areas.	Contractor	Duration of construction
The siting of the construction equipment camp/s must take cognisance of any sensitive areas identified in the BA Report.	Contractor	Duration of construction
During excavation activities, the topsoil and vegetation should be stockpiled separately from other material outside of the 32 m NEMA ZoR.	Contractor	Site establishment, and duration of construction
Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.	Contractor	Construction
Excavated materials should not be contaminated, and it should be ensured that the minimum surface area is taken up by any stockpiled materials. The mixture of the lower and upper layers of the excavated soil should be kept to a minimum, so as for later use as backfill material after construction has commenced.	Contractor	Pre-construction Construction
Any individuals of protected species affected by and observed within the development footprint during construction should be translocated under the supervision of the Contractor's SHE or EO.	SHE/EO Specialist	Construction
Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.	Contractor	Construction
All exposed soil must be protected from wind using tarpaulins for the duration of the construction phase to prevent potential erosion and sedimentation of the watercourses.	Contractor	Construction
Suitable drainage should be ensured along the construction camp, in order to ensure that water does not pond within the footprint area or drain in a concentrated manner into the watercourses. This must be considered as part of the stormwater management plan and be overseen by a freshwater ecologist.	Contractor Specialist	Construction
Construction of the proposed construction camp may result in disturbance to the natural buffer zone surrounding the watercourses which may result in the reduction of surface roughness. This can be mitigated by ensuring that no	Contractor	Construction

Mitigation: Action/Control	Responsibility	Timeframe
concentrated runoff from the surface infrastructure construction areas enter the watercourses by installing silt traps or placing haybales down gradient of the construction footprint (until suitable basal vegetation cover has been restored) to ensure no sediment laden or concentrated runoff generates from the construction footprint.		
All unattended open excavations must be adequately demarcated and/or fenced.	Contractor	Construction
Establish appropriately bunded areas for storage of hazardous materials (e.g. fuel to be required during construction).	Contractor	Site establishment, and duration of construction
Soil must be suitably compacted, and all construction material must be removed from the site upon the completion of construction or used in the rehabilitation process.	Contractor	Construction and operational phase
Cleared alien vegetation must not be dumped on adjacent intact vegetation during clearing but must be temporarily stored in a demarcated area.	Contractor	Site establishment, and duration of construction
Establish the necessary ablation facilities with chemical toilets and provide adequate sanitation facilities and ablutions for construction workers so that the surrounding environment is not polluted (at least one sanitary facility for each sex and for every 30 workers as per the 2014 Construction Regulations; Section 30(1) (b)) at appropriate locations on site). The facilities must be placed within the construction area and along the road.	Contractor	Site establishment, and duration of construction
Ablution or sanitation facilities must not be located within 100m from a watercourse or within the 1:100 year flood.	Contractor	Site establishment, and duration of construction
The footprint of the development must be limited to the areas required for actual construction works and operational activities.	Contractor	Site establishment, and duration of construction

Performance Indicator	<ul style="list-style-type: none"> » Appropriate and adequate waste management and sanitation facilities provided at construction site. » Vegetation cover on and in the vicinity of the site is intact (i.e. full cover as per natural vegetation within the environment) with no evidence of degradation or erosion.
Monitoring	<ul style="list-style-type: none"> » An incident reporting system is used to record non-conformances to the EMPr. » EO and ECO <u>and/or ESCO</u> to monitor all construction areas on a continuous basis until all construction is completed. Non-conformances will be immediately reported to the site manager. » Monitoring of vegetation clearing during construction (by contractor as part of construction contract). » Monitoring of rehabilitated areas quarterly for at least a year following the end of construction (by contractor as part of construction contract).

OBJECTIVE 3: Protection of sensitive areas, flora, fauna and soils

Project Component/s	<ul style="list-style-type: none"> » New Access Road. » Upgrade of Existing District Road DR01469
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	<ul style="list-style-type: none"> » Widening and Upgrade of Constable and Supporting Constable Farm Roads » Construction camp and laydown area
Potential Impact	<ul style="list-style-type: none"> » Impacts on natural vegetation, habitats and fauna. » Loss of indigenous natural vegetation due to construction activities. » Impacts on soil. » Loss of topsoil. » Erosion.
Activity/Risk Source	<ul style="list-style-type: none"> » Vegetation clearing. » Site preparation (e.g. compaction) and earthworks. » Excavation of foundations. » Construction of infrastructure. » Stockpiling of topsoil, subsoil and spoil material.
Mitigation: Target/Objective	<ul style="list-style-type: none"> » To minimise the development area as far as possible. » To minimise impacts on surrounding sensitive areas. » To minimise impacts on soils. » Minimise spoil material. » Minimise erosion potential.

Mitigation: Action/Control	Responsibility	Timeframe
In order to minimise impacts on flora, fauna, and ecological processes, the development footprint should be limited to the minimum necessary to accommodate the required infrastructure.	Contractor	Duration of contract
Restricting the movement and construction to and within the authorised footprint area, which must be clearly marked, thereby limiting the impact on surrounding vegetation;	Contractor	Duration of contract
No indiscriminate driving through the veld is allowed. As far as possible vehicles are to utilise the existing roads. Where this is not feasible, new roads are to be located in areas of existing high disturbance, and not encroach upon sensitive habitats;	Contractor	Duration of contract
Botanical Search and rescue should occur in order to relocate permitted and appropriate species that would otherwise be lost from the construction footprint.	Contractor	Construction
All endangered species or protected species listed in Schedules 3 and 4 respectively, in terms of the Western Cape Nature Conservation Laws Amendment Act (Act 3 of 2000) may not be removed without the relevant permit, which must be obtained from CapeNature. This is also to ensure that rescued plant material is accounted for and used in the rehabilitation or relocation process.	Contractor	Construction
The site should be 'swept' by means of faunal search and rescue directly ahead of clearance teams. This is to relocate slow moving species such as tortoises that may not escape out of the construction area quickly enough when clearance begins. This needs to occur not more than a few hours ahead of clearance teams to prevent animals moving back into the area. Most mammals and faster moving species will move out of the area themselves at the onset of construction.	Contractor	Construction
No dumping of litter or vegetation refuse must be allowed on-site. As such it is advised that vegetation cuttings from landscaped areas be carefully collected and disposed of at a separate waste facility.	Contractor	Construction

Mitigation: Action/Control	Responsibility	Timeframe
The ESAs are all in relation to watercourses/aquatic areas that will be impacted upon by the road crossings of these areas. As a function of the WULA and any specialist aquatic studies mitigations for managing these crossings to protect the maintenance of flow rates and prevent siltation are expected and must be enacted. These measures could involve sub surface pipes, and silt nets.	Contractor	Construction
Floral SCC plants must be monitored to determine integrity of in situ specimens and the health of those that have been relocated.	Contractor	Construction
Edge effect control needs to be implemented to prevent further degradation and potential loss of floral SCC outside of the proposed disturbance footprint area.	Contractor	Construction
The application of suitable mitigations to maintain the quality and quantity of flows will enable the maintenance of the ESA as it should continue performing the same ecological function despite the slight change (wider road crossings).	Contractor	Construction
As far as possible, existing roads must be utilised to gain access to the site.	Contractor	Construction
The removed vegetation must be stockpiled outside of the delineated boundary of the watercourse. The footprint areas of these stockpiles should be kept to a minimum, and may not exceed a height of 2 m. Should the vegetation not be suitable for reinstatement after the construction phase or be alien/invasive vegetation species, all material must be disposed of at a registered garden refuse site and may not be burned or mulched on site.	Contractor	Duration of Construction
The area surrounding the road must be revegetated with suitable indigenous vegetation to prevent the establishment of alien vegetation species and to prevent erosion from occurring;	Contractor	Construction
Vegetation clearing must be limited to the required footprint for construction works. Mitigation measures must be implemented to reduce the risk of erosion and the invasion of alien species.	Contractor	Construction

Performance Indicator	<ul style="list-style-type: none"> » No disturbance outside of designated work areas. » Minimised clearing of existing vegetation. » Vegetation and habitat loss restricted to infrastructure footprint. » Removal to safety of fauna encountered during construction. » Low mortality of fauna due to construction machinery and activities » Topsoil appropriately stored, managed and rehabilitated. » Limited soil erosion around site. » No activity in restricted areas. » Minimal level of soil degradation.
Monitoring	<ul style="list-style-type: none"> » Contractor's Environmental Officer (EO) to provide supervision and oversight of vegetation clearing activities within sensitive areas such as near the pan. » Supervision of all clearing and earthworks.

OBJECTIVE 4: Minimise the establishment and spread of alien invasive plants

Major factors contributing to invasion by alien invader plants include high disturbance activities. Consequences of this may include:

- » Loss of indigenous vegetation;
- » Change in vegetation structure leading to change in various habitat characteristics;
- » Change in plant species composition;
- » Change in soil chemical properties;
- » Loss of sensitive habitats;
- » Loss or disturbance to individuals of rare, endangered, endemic, and/or protected species;
- » Fragmentation of sensitive habitats;
- » Change in flammability of vegetation, depending on alien species; and
- » Hydrological impacts due to increased transpiration and runoff.

Project Component/s	<ul style="list-style-type: none"> » New Access Road. » Upgrade of Existing District Road DR01469 » Widening and Upgrade of Constable and Supporting Constable Farm Roads » Construction camp and laydown area
Potential Impact	<ul style="list-style-type: none"> » Invasion of natural vegetation surrounding the site by declared weeds or invasive alien species. » Impacts on soil. » Impact on faunal habitats. » Degradation and loss of agricultural potential.
Activities/Risk Sources	<ul style="list-style-type: none"> » Transport of construction materials to site. » Movement of construction machinery and personnel. » Site preparation and earthworks causing disturbance to indigenous vegetation. » Construction of site access roads. » Stockpiling of topsoil, subsoil and spoil material. » Routine maintenance work – especially vehicle movement.
Mitigation: Target/Objective	<ul style="list-style-type: none"> » To significantly reduce the presence of weeds and eradicate alien invasive species. » To avoid the introduction of additional alien invasive plants to the site. » To avoid distribution and thickening of existing alien plants in the site. » To complement existing alien plant eradication programs in gradually causing a significant reduction of alien plant species throughout the site.

Mitigation: Action/Control	Responsibility	Timeframe
It is highly recommended that an alien vegetation management plan be compiled during the planning phase and implemented concurrently with the commencement of construction	Contractor	Duration of Construction
Avoid creating conditions in which alien plants may become established: <ul style="list-style-type: none"> » Keep disturbance of indigenous vegetation to a minimum. » Rehabilitate disturbed areas as quickly as possible. » Do not import soil from areas with alien plants. 	Contractor	Construction

Mitigation: Action/Control	Responsibility	Timeframe
When alien plants are detected, these must be controlled and cleared using the recommended control measures for each species to ensure that the problem is not exacerbated or does not re-occur.	Contractor	Construction
Eradicate all weeds and alien invasive plants as far as practically possible and ensure that material from invasive plants are adequately destroyed and not further distributed. Continually monitor the re-emergence of these species and manage according to the invasive species management plan.	Contractor	Construction
All existing alien and invasive vegetation should be removed. All material must be disposed of at a registered garden refuse site and may not be burned or mulched on site.	Developer Contractor	Pre-construction Construction
The use of herbicides and pesticides and other related horticultural chemicals should be carefully controlled and only applied by personnel adequately certified to apply pesticides and herbicides. It must be ensured that WHO Recommended Classification of Pesticides by Hazard Class 1a (extremely hazardous) or 1b (highly hazardous) are not purchased, stored or used on site along with any other nationally or internationally similarly restricted/banned products.	Contractor	Construction
To prevent the dispersal of alien seeds, construction vehicles and machinery must be washed regularly and away from any watercourse.	Contractor	Construction

Performance Indicator	» Low abundance of alien plants. For each alien species: number of plants and aerial cover of plants within the site and immediate surroundings.
Monitoring	<ul style="list-style-type: none"> » On-going monitoring of area by EO during construction. » Annual audit of development footprint and immediate surroundings by qualified botanist. » If any alien invasive species are detected then the distribution of these should be mapped (GPS co-ordinates of plants or concentrations of plants), number of individuals (whole site or per unit area), age and/or size classes of plants and aerial cover of plants. » The results should be interpreted in terms of the risk posed to sensitive habitats within and surrounding the site. » The environmental manager/site agent should be responsible for driving this process. » Reporting frequency depends on legal compliance framework.

OBJECTIVE 5: Minimise impact water quality and sediment balance of the watercourses

Project Component/s	<ul style="list-style-type: none"> » New Access Road. » Upgrade of Existing District Road DR01469 » Widening and Upgrade of Constable and Supporting Constable Farm Roads » Construction camp and laydown area
Potential Impact	<ul style="list-style-type: none"> » Operation of the proposed access road and throughflow structure » Disturbance to soil and ongoing erosion as a result of periodic maintenance activities

	<ul style="list-style-type: none"> » Concentrated runoff from the road crossing leading to erosion and subsequent sedimentation of the lower watercourse reaches/downgradient watercourses (increase in the sediment load) and turbulent flows when surface water is present. » Higher flood peaks into the watercourses due to reduced surface roughness in the watercourses. » Altered water quality (if surface water is present) as a result of increased availability of pollutants.
Activities/Risk Sources	<ul style="list-style-type: none"> » Possible indiscriminate movement of maintenance vehicles within and in close proximity to watercourses. » Possible spills / leaks from construction vehicles. » Removal of vegetation and associated disturbances to soil.
Mitigation: Target/Objective	<ul style="list-style-type: none"> » No indiscriminate movement of construction equipment through the watercourses may be permitted during standard operational activities or maintenance activities. Use must be made of the existing watercourse crossings only. » Stormwater runoff from the road crossings should be monitored (by the Operation and Maintenance (O&M) Manager), to ensure it does not result in erosion of the watercourses. Stormwater should be allowed to diffusely spread across the landscape, by ensuring adequate surface roughness in the watercourse (through vegetation and rocky areas). » Routine maintenance of the roads must be undertaken to ensure that no concentration of flow and subsequent erosion occurs due to the road crossings/instream infrastructure. Such maintenance activities must specifically be undertaken after high rainfall events. » During periodic maintenance activities of the roads, monitoring for erosion should be undertaken. » Should erosion be observed, caused by the road crossings/instream infrastructure, the area must be rehabilitated by infilling the erosion gully and revegetation thereof with suitable indigenous vegetation. Use can also be made of rocks collected from the surrounding area to infill any area prone to erosion, as a natural dispersal mechanism. » Ensure that routine inspections and monitoring of any instream infrastructure are undertaken to monitor any build-up of debris that will impact on structure integrity or lead to erosion and sedimentation. Furthermore, monitoring to determine the establishment of indigenous vegetation and the presence of any alien or invasive plant species. » Hot spots for the build-up of debris and excess sediment must be identified and when necessary, debris/excess sediment must be removed by hand to prevent future flooding and potential damage to infrastructure.
Target / Objective	<ul style="list-style-type: none"> » Prevent risk of sedimentation and/or impacts to water quality of the downgradient watercourses as a result of the operation and maintenance of the access road

Mitigation: Action/Control	Responsibility	Timeframe
Ensure that routine inspections and monitoring of the access road and any instream infrastructure are undertaken to monitor any build-up of debris that will impact on structure integrity or lead to erosion and sedimentation. Furthermore, monitoring to determine the establishment of indigenous vegetation and the presence of any alien or invasive plant species.	Contractor	During Construction
It is imperative that all preparatory and foundational construction works be undertaken during the driest period of the year when there is no flow within the watercourses, and thus no diversion of flow would be necessary.	Contractor	During Construction
All development footprint areas to remain as small as possible and vegetation clearing to be limited to what is essential.	Contractor	During Construction

Mitigation: Action/Control	Responsibility	Timeframe
The reaches of the watercourses where no activities are planned to occur must be considered no-go areas. These no-go areas can be marked at a maximum distance of 5 m upstream and downstream of the proposed road upgrade crossing. This 5 m buffer area would allow for construction personal, vehicles (if applicable) to enter the watercourse crossing where the road is proposed to be upgraded.	Contractor	During Construction
Retain as much indigenous vegetation as possible.	Contractor	During Construction
During construction of the Witberg access road, particularly the proposed new section of road to be constructed, regular spraying of non-potable water or the use of chemical dust suppressants, that are approved for use near watercourses must be implemented to reduce dust and to ensure no smothering of vegetation within the watercourses occurs from excessive dust settling. It must be noted that specifics as to what type of dust suppressant (grey water vs. chemical dust suppressant) that will be utilised as part of the proposed access road was not available at the time of assessment. Should this detail become available, it is recommended that the freshwater ecologist provide a statement on the suitability of the use of the proposed dust suppressant.	Contractor	During Construction
As far as possible, existing roads must be utilised to gain access to the site.	Contractor	During Construction
Contractor laydown areas, and material storage facilities to remain outside of the watercourse and at least 32 m thereof.	Contractor	During Construction
The removed vegetation must be stockpiled outside of the delineated boundary of the watercourse. The footprint areas of these stockpiles should be kept to a minimum, and may not exceed a height of 2 m. Should the vegetation not be suitable for reinstatement after the construction phase or be alien/invasive vegetation species, all material must be disposed of at a registered garden refuse site and may not be burned or mulched on site.	Contractor	During Construction
Upgrading of the north-western section of the Witberg access road/Constable Road (where applicable) must take cognisance of the delineated extent of the ephemeral tributary located within close proximity to the road. Should the road be increased in width, the road must be expanded on the side opposite of the watercourse, to ensure that the remaining natural buffer between the access road and the watercourse remains intact.	Contractor	During Construction
A coffer dam area can be created and dewatered around the construction area associated with the installation of culvert structures by using sandbags and cobbles.	Contractor	During Construction
Water must be diverted into the downstream reaches, around the coffer area. Water must be allowed to flow to the downstream reaches at all times.	Contractor	During Construction
Sediment traps must be installed every 20 m downstream for any works for a length of 200 m.	Contractor	During Construction
Ensure that the creation of the diversion (by means of sandbags) does not result in a significant water level difference upstream or downstream of the installation site.	Contractor	During Construction

Mitigation: Action/Control	Responsibility	Timeframe
It is recommended that a suitably qualified freshwater specialist and Environmental Control Officer (ECO) should monitor any coffer dam areas created on site as well as sediment traps at least bimonthly during the construction period to monitor the ephemeral and episodic watercourses associated with the larger river systems conditions during construction and after the removal of the diversion.	Contractor Specialist ECO <u>and/or</u> ESCO	During Construction
Fresh concrete and cement mortar should not be mixed near the watercourses or below the 1:100-year floodline. Mixing of cement may be done within a construction camp, however it may not be mixed on bare soil, and must be within a lined, bound or bunded portable mixer. Consideration must be given to the use of ready-mix concrete.	Contractor	During Construction
No mixed concrete shall be deposited directly onto the ground or within the watercourses. All concrete must be brought in via a cement mixing truck which must remain within the road reserve, and cement must be piped down to the proposed bridge/culvert crossing. Any areas that require manual application of cement require that the mixed materials be placed on a batter board or other suitable platform/mixing tray until it is deposited.	Contractor	During Construction
A washout area should be designated outside of the delineated extent of the watercourses and the 1:100-year floodline, and wash water should be treated on-site or discharged to a suitable sanitation system.	Contractor	During Construction
At no point may batter boards/mixing trays or cement trucks be rinsed off on site and run-off water may not be allowed into the watercourses.	Contractor	During Construction
Cement bags (if any) must be disposed of in the demarcated hazardous waste receptacles and the used bags must be disposed of through the hazardous substance waste stream.	Contractor	During Construction

Performance Indicator	<ul style="list-style-type: none"> » No signs of erosion and sedimentation of the watercourses. » Alien invasive species removal/establishment should be monitored.
Monitoring	<ul style="list-style-type: none"> » Ensure that routine inspections and monitoring of any instream infrastructure are undertaken to monitor any build-up of debris that will impact on structure integrity or lead to erosion and sedimentation. Furthermore, monitoring to determine the establishment of indigenous vegetation and the presence of any alien or invasive plant species.

OBJECTIVE 6: Protection of heritage resources

One rock art site of high sensitivity have been identified on the site, but will not be directly impacted by the proposed road development. Direct impacts are anticipated for the stone wall which the proposed access road traverses. The area underlain by sediments have very high paleontological sensitivity. Although the likelihood of finding fossils appears to be low, the importance if they are found would be high to very high.

Project Component/s	<ul style="list-style-type: none"> » New Access Road. » Upgrade of Existing District Road DR01469 » Widening and Upgrade of Constable and Supporting Constable Farm Roads » Construction camp and laydown area
Potential Impact	» Heritage objects or artefacts found on site are inappropriately managed or destroyed.
Activity/Risk Source	» Site preparation and earthworks.
Mitigation: Target/Objective	» To ensure that any heritage objects found on site are treated appropriately and in accordance with the relevant legislation.

Mitigation: Action/control	Responsibility	Timeframe
Contractors must be informed before construction starts on the possible types of heritage sites and cultural material they may encounter and the procedures to follow if they find sites. All staff should also be familiarised with procedures for dealing with heritage objects/sites.	Contractor, ESA and heritage specialist	Duration of contract, particularly during excavations
A Heritage Agreement and Management Plan must be developed in conjunction with HWC and implemented to ensure the ongoing conservation and management of the rock art site.	Contractor Heritage specialist	Construction
The Chance Fossil Finds Procedure as attached (Appendix A of this EMPr) must be implemented for the duration of construction activities	Contractor Heritage specialist	Construction
Should any buried archaeological resources or burials be uncovered during the course of development activities, work must cease in the vicinity of these finds. Heritage Western Cape (HWC) must be contacted immediately in order to determine an appropriate way forward.	Contractor Heritage specialist	Construction
<u>The Chance Fossil Finds Procedure must be implemented for the duration of construction activities.</u>	<u>Contractor</u>	<u>Construction</u>
<u>Should any buried archaeological resources or burials be uncovered during the course of development activities, work must cease in the vicinity of these finds. Heritage Western Cape (HWC) must be contacted immediately and a professional archaeologist or palaeontologist must be contacted as soon as possible to inspect the findings.</u>	<u>Contractor</u> <u>EO</u>	<u>Construction</u>

Performance Indicator	<ul style="list-style-type: none"> » No disturbance outside of designated work areas. » All heritage items located are dealt with as per the legislative guidelines.
Monitoring	<ul style="list-style-type: none"> » Due care taken during earthworks and disturbance of land by all staff and any heritage objects found reported. » Appropriate permits obtained from HWC prior to the disturbance or destruction of heritage sites (if required). » An incident reporting system will be used to record non-conformances to the EMPr.

OBJECTIVE 7: Management of dust and air emissions

During the construction phase, limited gaseous or particulate emissions are anticipated from exhaust emissions from construction vehicles and equipment on-site, as well as vehicle entrained dust from the movement of vehicles on the main and internal access roads.

Project component/s	<ul style="list-style-type: none"> » New Access Road. » Upgrade of Existing District Road DR01469 » Widening and Upgrade of Constable and Supporting Constable Farm Roads » Construction camp and laydown area
Potential Impact	<ul style="list-style-type: none"> » Dust generation and particulates from vehicle movement to and on-site, , road construction activities, road maintenance activities, temporary stockpiles, and vegetation clearing affecting the surrounding residents and visibility. » Release of minor amounts of air pollutants (for example NO₂, CO and SO₂) from vehicles and construction equipment.
Activity/risk source	<ul style="list-style-type: none"> » Clearing of vegetation and topsoil. » Excavation, grading, scraping, levelling, digging, drilling and associated construction activities. » Transport of materials, equipment, and components on internal access roads and the associated increased traffic. » Vehicle movement on gravel roads. » Re-entrainment of deposited dust by vehicle movements. » Wind erosion from topsoil and spoil stockpiles and unsealed roads and surfaces. » Fuel burning vehicle and construction engines.
Mitigation: Target/Objective	<ul style="list-style-type: none"> » To ensure emissions from all vehicles and construction engines are minimised, where possible, for the duration of the construction phase. » To minimise nuisance to the community from dust emissions and to comply with workplace health and safety requirements for the duration of the construction phase. » Suppression of dust, pollution control and minimise dust generation.

Mitigation: Action/control	Responsibility	Timeframe
Implement appropriate dust suppression measures on a regular basis along the gravel access road and on the proposed site.	Contractor	Construction
Use of dust suppressants on roads and limit development of new roads.	Contractor	Construction
Appropriate dust suppressant must be applied on all gravel roads associated, exposed areas and stockpiles associated to the project as required to minimise/control airborne dust.	Contractor	Duration of contract
Speed of construction vehicles must be restricted to 40km/hr on all roads within the site.	Contractor	Duration of contract
Dust-generating activities or earthworks may need to be rescheduled or the frequency of application of dust control/suppressant increased during periods of high winds if visible dust is blowing toward nearby residences outside the site.	Contractor	Duration of contract
Disturbed areas must be re-vegetated as soon as practicable in line with the progression of construction activities.	Contractor	Completion of construction

Mitigation: Action/control	Responsibility	Timeframe
Vehicles and equipment must be maintained in a road-worthy condition at all times.	Contractor	Duration of contract
All vehicles and containers used for moving waste must encapsulate the waste, which prevents the waste from causing odours and from escaping or blowing around the site. This will also prevent leachate material from spilling out of the containers, which is hazardous.	Contractor	Duration of contract

Performance Indicator	<ul style="list-style-type: none"> » No complaints from affected residents or community regarding dust or vehicle emissions. » Visual presence of dust and air quality. » Dust does not cause health (inhaling, eye irritation) and safety risks (low visibility). » Dust suppression measures implemented for all heavy vehicles that require such measures during the construction phase. » Drivers made aware of the potential safety issues and enforcement of strict speed limits when they are employed. » All heavy vehicles equipped with speed monitors before they are used in the construction phase in accordance with South African vehicle legislation. » Road worthy certificates in place for all heavy vehicles at outset of construction phase and up-dated on a monthly basis. » A complaints register must be maintained, in which any complaints from neighbouring farmers will be logged, and thereafter complaints will be investigated and, where appropriate, acted upon. » Compliance with national ambient air quality standards based on passive sampling campaign.
Monitoring	<p>Where necessary, monitoring must be undertaken to ensure emissions are not exceeding the prescribed levels via any of the following methods:</p> <ul style="list-style-type: none"> » Immediate reporting by personnel of any potential or actual issues with nuisance dust or emissions to the Site Manager. » A complaints register must be maintained, in which any complaints from residents/the community will be logged, and thereafter complaints will be investigated and, where appropriate, acted upon. » An incident register and non-conformance must be used to record incidents and non-conformances to the EMPr. » A complaints register must be used to record grievances by the public. » Dustfall monitoring at the homesteads along the access road. Measured daily dustfall rates should not exceed the acceptable dustfall standards for residential areas.

OBJECTIVE 8: Appropriate handling and management of waste

The construction of the proposed development will involve the generation of various wastes. In order to manage the wastes effectively, guidelines for the assessment, classification, and management of wastes, along with industry principles for minimising construction wastes must be implemented. The main wastes expected to be generated by the construction activities include:

- » general solid waste;
- » hazardous waste;
- » inert waste (rock and soil); and

» liquid waste (including grey water and sewage).

Project Component/s	<ul style="list-style-type: none"> » New Access Road. » Upgrade of Existing District Road DR01469 » Widening and Upgrade of Constable and Supporting Constable Farm Roads » Construction camp and laydown area
Potential Impact	<ul style="list-style-type: none"> » Inefficient use of resources resulting in excessive waste generation. » Litter or contamination of the site or water through poor waste management practices.
Activity/Risk Source	<ul style="list-style-type: none"> » Other construction wastes. » Spoil material from excavation, earthworks and site preparation.
Mitigation: Target/Objective	<ul style="list-style-type: none"> » To comply with waste management legislation. » To minimise production of waste. » To ensure appropriate waste storage and disposal. » To avoid environmental harm from waste disposal. » A waste manifests should be developed for the ablutions showing proof of disposal of sewage at appropriate water treatment works.

Mitigation: Action/Control	Responsibility	Timeframe
<u>An integrated waste management approach must be implemented that is based on waste minimisation and must incorporate reduction, recycling, re-use, and disposal where appropriate. Any solid waste must be disposed of at a landfill licensed in terms of Section 20 (b) of the National Environment Management Waste Act, 2008 (Act No.59 of 2008).</u>	<u>Contractor</u>	<u>Duration of contract</u>
Construction method and materials should be carefully considered in view of waste reduction, re-use, and recycling opportunities.	Contractor	Duration of contract
Construction contractors must provide specific detailed waste management plans to deal with all waste streams.	Contractor	Duration of contract
Ensure that no litter, refuse, wastes, rubbish, rubble, debris and builders wastes generated on the premises be placed, dumped or deposited on adjacent/surrounding properties, and that the waste is disposed of at dumping site as approved by the Council.	Contractor	Duration of contract
Waste disposal at the construction site must be avoided by separating and trucking out of waste.	Contractor	Construction
Specific areas must be designated on-site for the temporary management of various waste streams, i.e. general refuse, construction waste (wood and metal scrap), and contaminated waste as required. Location of such areas must seek to minimise the potential for impact on the surrounding environment, including prevention of contaminated runoff, seepage, and vermin control.	Contractor	Duration of contract
Where practically possible, construction and general wastes on-site must be reused or recycled. Bins and skips must be available on-site for collection, separation, and storage of waste streams (such as wood, metals, general refuse etc.).	Contractor	Duration of contract
Disposal of waste must be in accordance with relevant legislative requirements, including the use of licensed contractors.	Contractor	Duration of contract
Uncontaminated waste must be removed at least weekly for disposal, if feasible; other wastes must be removed for recycling/ disposal at an appropriate frequency.	Contractor	Duration of contract

Mitigation: Action/Control	Responsibility	Timeframe
Waste must be kept to a minimum and must be transported by approved waste transporters to sites designated for their disposal.	Contractor	Duration of contract
No liquid waste, including grey water, may be discharged into any water body or drainage line. All sewage disposal to take place at a registered and operational wastewater treatment works. Slips of disposal to be retained as proof of responsible disposal.	Contractor	Maintenance: duration of contract within a particular area
All liquid wastes should be contained in appropriately sealed vessels/ponds within the footprint of the development, and be disposed of at a designated waste management facility after use.	Contractor	Duration of contract
Ensure compliance with all national, regional and local legislation with regard to the storage, handling and disposal of hydrocarbons, chemicals, solvents and any other harmful and hazardous substances and materials. The onus is on the Contractor to identify and interpret the applicable legislation. Hazardous waste to be disposed of at a registered landfill site.	Contractor	During and post construction.
Documentation (waste manifest) must be maintained detailing the quantity, nature, and fate of any regulated waste. Waste disposal records must be available for review at any time.	Contractor	Duration of contract
SABS approved spill kits to be available and easily accessible.	Contractor	Duration of contract
Regularly serviced chemical toilet facilities and/or septic tank must be used to ensure appropriate control of sewage.	Contractor	Duration of contract
Daily inspection of all chemical toilets and septic tanks must be performed by environmental representatives on site.	Contractor	Duration of contract
In the event where sewage is discharged into the environment, all contaminated vegetation/ rock and soil must be removed immediately and treated as hazardous waste.	Contractor	Duration of construction
Ensure that the below ground storage of the septic tank can withstand the external forces of the surrounding pressure. The area above the tank must be demarcated to prevent any vehicles or heavy machinery from driving around the tank.	Contractor	Duration of construction
Under no circumstances may waste be burnt on site.	Contractor	Duration of construction
Where a registered waste site is not available close to the construction site, provide a method statement with regard to waste management.	Contractor	Duration of construction
Waste manifests must be provided for all waste streams generated on site, and must be kept on site.	Contractor	Duration of construction
Implement an integrated waste management approach that is based on waste minimisation and incorporates reduction, recycling, re-use and disposal where appropriate. Where solid waste is disposed of, such disposal shall only occur at a landfill licensed in terms of section 20(b) of the National Environmental Management Waste Act, 2008 (Act 59 of 2008).	Contractor	Duration of construction
All vehicle re-fuelling is to take place outside of the 100 m GN509 ZoR.	Contractor	Duration of construction
Material to be used (gravel – if applicable) as part of the upgrading and construction activities associated with the Witberg access road must be stockpiled outside the 32 m NEMA ZoR of the watercourses	Contractor	Duration of construction

Mitigation: Action/Control	Responsibility	Timeframe
to prevent sedimentation thereof and to avoid any other vegetation being impacted by the construction activities. These stockpiles may not exceed a height of 2 m and should be protected from wind using tarpaulins.		
Cement bags (if any) must be disposed of in the demarcated hazardous waste receptacles and the used bags must be disposed of through the hazardous substance waste stream.	Contractor	Duration of construction
Upon the completion of construction, the area must be cleared of potentially polluting materials. Spoil stockpiles must also be removed and appropriately disposed of or the materials re-used for an appropriate purpose.	Contractor	Completion of construction
Upon the completion of construction, all sanitation facilities (including chemical toilets) must be removed, as well as the associated waste to be disposed of at a registered waste disposal site.	Contractor	Completion of construction
Litter generated by the construction crew must be collected in rubbish bins and disposed of weekly, or at an appropriate frequency, at registered waste disposal sites.	Contractor	Duration of construction
All building rubble, solid and liquid waste etc. generated during the construction activities must be disposed of as necessary at an appropriately licensed refuse facility.	Contractor	Duration of construction
Ensure that no refuse wastes are burnt on the premises or on surrounding premises. No fires will be allowed on site.	Contractor	Duration of construction
Ensure that no litter, refuse, wastes, rubbish, rubble, debris and builders wastes generated on the premises be placed, dumped or deposited on adjacent/surrounding properties during or after the construction period of the project and that the waste is disposed of at dumping site as approved by the Council.	Contractor	Duration of construction
<u>Foundations and trenches must be backfilled with originally excavated materials as much as possible. Excess excavation materials must be disposed of only in approved areas or, if suitable, stockpiled for use in reclamation activities.</u>	<u>Contractor</u>	<u>Duration of construction</u>

Performance Indicator	<ul style="list-style-type: none"> » No complaints received regarding waste on site or indiscriminate dumping. » Internal site audits ensuring that waste segregation, recycling and reuse is occurring appropriately. » Provision of all appropriate waste manifests for all waste streams.
Monitoring	<ul style="list-style-type: none"> » Observation and supervision of waste management practices throughout construction phase. » Waste collection will be monitored on a regular basis. » Waste documentation completed. » Proof of disposal of sewage at an appropriate wastewater treatment works. » A complaints register will be maintained, in which any complaints from the community will be logged. Complaints will be investigated and, if appropriate, acted upon. » An incident reporting system will be used to record non-conformances to the EMPr.

OBJECTIVE 9: Ensure appropriate rehabilitation of disturbed areas such that residual environmental impacts are remediated or curtailed

Areas requiring rehabilitation will include all areas disturbed during the construction phase and that are not required for regular operation and maintenance operations. Rehabilitation should be undertaken in an area as soon as possible after the completion of construction activities within that area.

Project component/s	<ul style="list-style-type: none"> » New Access Road. » Upgrade of Existing District Road DR01469 » Widening and Upgrade of Constable and Supporting Constable Farm Roads » Construction camp and laydown area
Potential Impact	<ul style="list-style-type: none"> » Environmental integrity of the site undermined resulting in reduced visual aesthetics, erosion, compromised land capability and the requirement for on-going management intervention.
Activity/risk source	<ul style="list-style-type: none"> » Site preparation and earthworks. » Temporary laydown areas. » Temporary access roads/tracks. » Other disturbed areas/footprints.
Mitigation: Target/Objective	<ul style="list-style-type: none"> » To ensure and encourage site rehabilitation of disturbed areas. » To ensure that the site is appropriately rehabilitated following the execution of the works, such that residual environmental impacts (including erosion) are remediated or curtailed.

Mitigation: Action/control	Responsibility	Timeframe
A site rehabilitation programme should be compiled and implemented.	Contractor consultation Specialist	in with Construction
Following construction, rehabilitation of all areas disturbed not required for operation must be undertaken.	Contractor	Rehabilitation
Any areas disturbed during the construction phase should be encouraged to rehabilitate as fast and effective as possible and were deemed necessary by the <u>ECO and/or ESCO</u> or Contractor's EO, artificial rehabilitation (e.g. re-seeding with collected or commercial indigenous seed mixes) should be applied in order to speed up the rehabilitation process in critical areas (e.g. steep slopes and unstable soils).	Contractor	Rehabilitation
Rehabilitation of the working areas must be concurrent with the construction of the project.	Contractor	Construction
The laydown and site camp areas must be restored only with genetically appropriate species (from the same vegetation type and within 5km of the area) following the completion of the construction.	Contractor	Rehabilitation of areas where construction is completed
Stockpiled material should be used as backfill material during rehabilitation.	Contractor	Construction
All excavated areas should be backfilled to the natural ground level with excavated material	Contractor	Construction
All temporary facilities, equipment and waste materials must be removed from site and appropriately disposed of.	Contractor	Rehabilitation

Mitigation: Action/control	Responsibility	Timeframe
On-going alien plant monitoring and removal should be undertaken on all areas of natural vegetation on an annual basis.	Contractor	Construction
Performance Indicator	<ul style="list-style-type: none"> » All portions of site, including construction camp and working areas, cleared of equipment and temporary facilities. » Topsoil replaced on all areas and stabilised. » Disturbed areas rehabilitated and acceptable plant cover achieved on rehabilitated sites. » Closed site free of erosion and alien invasive plants. 	
Monitoring and Reporting	<ul style="list-style-type: none"> » On-going inspection of rehabilitated areas in order to determine the effectiveness of the rehabilitation measures implemented during the operational lifespan of the wind farm. » On-going alien plant monitoring and removal should be undertaken on an annual basis. » An incident reporting system must be used to record non-conformances to the EMPr. 	

6.3 Detailing Method Statements

OBJECTIVE 10: Ensure all construction activities are undertaken with the appropriate level of environmental awareness to minimise environmental risk

The environmental specifications are required to be underpinned by a series of Method Statements, within which the Contractors and Service Providers are required to outline how any identified environmental risks will practically be mitigated and managed for the duration of the contract, and how specifications within this EMPr will be met. That is, the Contractor will be required to describe how specified requirements will be achieved through the submission of written Method Statements to the Site Manager, ECO and/or ESCO.

A Method Statement is defined as “a written submission by the Contractor in response to the environmental specification or a request by the Site Manager, setting out the plant, materials, labour and method the Contractor proposes using to conduct an activity, in such detail that the Site Manager is able to assess whether the Contractor’s proposal is in accordance with the Specifications and/or will produce results in accordance with the Specifications”. The Method Statement must cover applicable details with regard to:

- » Responsible person/s;
- » Construction procedures;
- » Materials and equipment to be used;
- » Getting the equipment to and from site;
- » How the equipment/material will be moved while on-site;
- » How and where material will be stored;
- » The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- » Timing and location of activities;
- » Compliance/non-compliance with the Specifications; and
- » Any other information deemed necessary by the Site Manager.

Method Statements must be compiled for all activities which affect any aspect of the environment and should be applied consistently to all activities. Specific areas to be addressed in the method statement: pre, during and post construction include:

- » Site establishment (which explains all activities from induction training to offloading, construction sequence for site establishment and the different amenities and to be established etc. Including a site camp plan indicating all of these).
- » Preparation of the site (i.e. clearing vegetation, compacting soils and removing existing infrastructure and waste).
- » Soil management/stockpiling and erosion control.
- » Excavations and backfilling procedure.
- » Stipulate norms and standards for water supply and usage (i.e.: comply strictly to licence and legislation requirements and restrictions).
- » Storm water method statement.
- » Ablution facilities (placement, maintenance, management and servicing).
- » Solid Waste Management:
 - * Description of the waste storage facilities (on site and accumulative).
 - * Placement of waste stored (on site and accumulative).
 - * Management and collection of waste process.
 - * Recycle, re-use and removal process and procedure.
- » Liquid waste management.
- » Design, establish, maintain and operate suitable pollution control facilities necessary to prevent discharge of water containing polluting matter or visible suspended materials into the surrounding environment. Should grey water (i.e. water from basins, showers, baths, kitchen sinks etc.) need to be disposed of, link into an existing facility where possible. Where no facilities are available, grey water runoff must be controlled to ensure no seepage into the surrounding environment occurs.
- » Dust and noise pollution:
 - * Describe the necessary measures to ensure that noise from construction activities is maintained within lawfully acceptable levels.
 - * Procedure to control dust at all times on the site, access roads and spoil sites (dust control shall be sufficient so as not to have significant impacts in terms of the biophysical and social environments). These impacts include visual pollution, decreased safety due to reduced visibility, negative effects on human health and the ecology due to dust particle accumulation.
- » Hazardous substance storage (ensure compliance with all national, regional and local legislation with regard to the storage of oils, fuels, lubricants, solvents, wood treatments, bitumen, cement, pesticides and any other harmful and hazardous substances and materials. South African National Standards apply).
 - * Lists of all potentially hazardous substances to be used.
 - * Appropriate handling, storage and disposal procedures.
 - * Prevention protocol of accidental contamination of soil at storage and handling areas.
 - * All storage areas, (i.e. for harmful substances appropriately bunded with a suitable collection point for accidental spills must be implemented and drip trays underneath dispensing mechanisms including leaking engines/machinery).
- » Fire prevention and management measures on site.
- » Fauna and flora protection process on and off site (i.e. removal to reintroduction or replanting, if necessary).
 - * Rehabilitation, re-vegetation process and bush clearing.
- » Incident and accident reporting protocol.
- » General administration.
- » Designate access road and the protocols while roads are in use.
- » Requirements on gate control protocols.

The Contractor may not commence the activity covered by the Method Statement until it has been approved by the Site Manager (with input from the ECO and/or ESCO), except in the case of emergency activities and then only with the consent of the Site Manager. Approval of the Method Statement will not absolve the Contractor from their obligations or responsibilities in terms of their contract. Failure to submit a method statement may result in suspension of the activity concerned until such time as a method statement has been submitted and approved.

6.4 Awareness and Competence: Construction Phase

OBJECTIVE 11: To ensure all construction personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and on-going minimisation of environmental harm

To achieve effective environmental management, it is important that all personnel involved in the project are aware of the responsibilities in terms of the relevant environmental legislation and the contents of this EMPr. The ECO and/or ESCO is responsible for monitoring compliance pre, during and post construction. The contractor is responsible for informing employees and sub-contractors of their environmental obligations in terms of the environmental specifications, and for ensuring that employees are adequately experienced and properly trained in order to execute the works in a manner that will minimise environmental impacts.

The Contractors obligations in this regard include the following:

- » All Employees must have a basic understanding of the key environmental features of the construction site and the surrounding environment. This includes the discussion/explanation of site environmental matters during toolbox talks.
- » The content and requirements of Method Statements are to be clearly explained to all plant operators and general workers. All staff acting in a supervisory capacity are to have copies of the relevant Method Statements and be aware of the contents thereof.
- » Ensuring that a copy of the EMPr is readily available on-site, and that all senior site staff are aware of the location and have access to the document. Senior site staff will be familiar with the requirements of the EMPr and the environmental specifications as they apply to the construction of the access road.
- » Ensuring that, prior to commencing any site works, all employees and sub-contractors have attended an Environmental Awareness Training session. The training session must provide the site staff with an appreciation of the project's environmental requirements, and how they are to be implemented.
 - * Records must be kept of those that have completed the relevant training.
 - * Training should be done either in a written or verbal format but must be appropriate for the receiving audience.
 - * Refresher sessions must be held to ensure the contractor staff are aware of their environmental obligations as practically possible.
- » All sub-contractors must have a copy of the EMPr and sign a declaration/ acknowledgement that they are aware and familiar with the contents and requirements of the EMPr and that they will conduct work in such a manner as to ensure compliance with the requirements of the EMPr.
- » Contractors and main sub-contractors should have a basic training in the identification of archaeological sites/objects, and protected flora and fauna that may be encountered on the site.

- » Awareness of any other environmental matters, which are deemed to be necessary by the ECO and/or ESCO.
- » Ensuring that employee information posters, outlining the environmental “do's” and “don'ts” (as per the environmental awareness training course) are erected at prominent locations throughout the site.

Therefore, prior to the commencement of construction activities on site and before any person commences with work on site thereafter, adequate environmental awareness and responsibility are to be appropriately presented to all staff present onsite, clearly describing their obligations towards environmental controls and methodologies in terms of this EMPr. This training and awareness will be achieved in the following ways:

6.4.1 Environmental Awareness and Induction Training

The EO, in consultation with the contractor, shall ensure that all construction workers receive an induction presentation, as well as on-going environmental education and awareness, on the importance and implications of the EMPr and the environmental requirements it prescribes. The presentation shall be conducted, as far as is possible, in the employees' language of choice. The contractor should provide a translator from their staff for the purpose of translating should this be necessary.

As a minimum, induction training should include:

- » Explanation of the importance of complying with the EMPr;
- » Explanation of the importance of complying with the Environmental Authorisation;
- » Discussion of the potential environmental impacts of construction activities;
- » Awareness regarding sensitivities on the site, including sensitive plant species (including the use of visual aids and on-site identification);
- » The benefits of improved personal performance;
- » Employees' roles and responsibilities, including emergency preparedness (this should be combined with this induction, but presented by the contractor's Health and Safety Representative);
- » Explanation of the mitigation measures that must be implemented when carrying out their activities; and
- » Explanation of the specifics of this EMPr and its specification (no-go areas, etc.).

Environmental Awareness Training must take the form of an on-site talk and demonstration by the EO/ECO and/or ESCO before the commencement of site establishment and construction on site. The education/awareness programme should be aimed at all levels of management and construction workers within the contractor team. A record of attendance of this training must be maintained by the EO/ECO and/or ESCO on site. Proof of awareness training should be kept on record. Environmental induction training must be presented to all persons who are to work on the site – be it for short or long durations; Contractor's or Engineer's staff; administrative or site staff; sub-contractors or visitors to site.

This induction training should be undertaken by the Contractor's Environmental Officer and should include discussing Red Rocket South Africa (Pty) Ltd's environmental policy and values, the function of the EMPr and Contract Specifications and the importance and reasons for compliance to these. The induction training must highlight overall do's and don'ts on site and clarify the repercussions of not complying with these. The non-conformance reporting system must be explained during the induction as well. Opportunity for questions and clarifications must form part of this training. A record of attendance of this training must be maintained by the EO/ECO and/or ESCO on site.

6.4.2 Toolbox Talks

Toolbox talks should be held on a scheduled and regular basis (at least twice a month) where foremen, environmental and safety representatives of different components of the works and sub-consultants hold talks relating to environmental practices and safety awareness on site. These talks should also include discussions on possible common incidents occurring on site and ones recommended by the on site EO and the prevention of reoccurrence thereof. Records of attendance and the awareness talk subject must be kept on file.

6.5 Monitoring Programme: Construction Phase

OBJECTIVE 12: To monitor the performance of the control strategies employed against environmental objectives and standards

A monitoring programme must be in place not only to ensure conformance with the EMPr, but also to monitor any environmental issues and impacts which have not been accounted for in the EMPr that are, or could result in significant environmental impacts for which corrective action is required. The period and frequency of monitoring will be stipulated by the Environmental Authorisation (once issued). Where this is not clearly dictated, the Developer will determine and stipulate the period and frequency of monitoring required in consultation with relevant stakeholders and authorities. The Technical Director/ Project Manager will ensure that the monitoring is conducted and reported.

The aim of the monitoring and auditing process would be to monitor the implementation of the specified environmental specifications, in order to:

- » Monitor and audit compliance with the prescriptive and procedural terms of the environmental specifications;
- » Ensure adequate and appropriate interventions to address non-compliance;
- » Ensure adequate and appropriate interventions to address environmental degradation;
- » Provide a mechanism for the lodging and resolution of public complaints;
- » Ensure appropriate and adequate record keeping related to environmental compliance;
- » Determine the effectiveness of the environmental specifications and recommend the requisite changes and updates based on audit outcomes, in order to enhance the efficacy of environmental management on site; and
- » Aid in communication and feedback to authorities and stakeholders.

All documentation e.g. audit/monitoring/compliance reports and notifications, required to be submitted to the DEA&DP in terms of the Environmental Authorisation, must be submitted to the Director: Compliance Monitoring of the Department.

Records relating to monitoring and auditing must be kept on site and made available for inspection to any relevant and competent authority in respect of this development.

6.5.1. Non-Conformance Reports

All supervisory staff including Foremen, Engineers, and the ECO and/or ESCO must be provided the means to be able to submit non-conformance reports to the Site Manager. Non-conformance reports will describe, in detail, the cause, nature and effects of any environmental non-conformance by the Contractor.

The non-conformance report will be updated on completion of the corrective measures indicated on the finding sheet. The report must indicate that the remediation measures have been implemented timeously and that the non-conformance can be closed-out to the satisfaction of the Site Manager and ECO and/or ESCO.

6.5.2. Monitoring Reports

A monitoring report will be compiled by the ECO and/or ESCO on a monthly basis and must be submitted to the Director: Compliance Monitoring at DEA&DP for their records. This report should include details of the activities undertaken in the reporting period, any non-conformances or incidents recorded, corrective action required, and details of those non-conformances or incidents which have been closed out. The contractor must ensure that all waste manifests are provided to the ECO and/or ESCO on a monthly basis in order to inform and update the DEA&DP regarding waste related activities.

6.5.3. Audit Reports

The holder of the Environmental Authorisation must, for the period during which the Environmental Authorisation and EMPr remain valid, ensure that project compliance with the conditions of the Environmental Authorisation and the EMPr are audited, and that the audit reports are submitted to the Director: Compliance Monitoring of the DFFE.

An environmental internal audit must be conducted and submitted every 3 months and an external audit must be conducted once a year. An annual audit report must be compiled and submitted to DFFE until the completion of the construction and rehabilitation. This report must be compiled in accordance with Appendix 7 of the EIA Regulations, 2014, as amended, and indicate the date of the audit, the name of the auditor and the outcome of the audit in terms of compliance with the environmental authorisation conditions and the requirements of the EMPr.

6.5.4. Final Audit Report

A final environmental audit report must be compiled by an independent auditor and be submitted to DFFE upon completion of the construction and rehabilitation activities. The report must be submitted within 30 days of completion of rehabilitation activities. This report must indicate the date of the audit, the name of the auditor and the outcome of the audit in terms of compliance with the environmental authorisation conditions and the requirements of the EMPr.

CHAPTER 7: OPERATION MANAGEMENT PROGRAMME

Overall Goal: To ensure that the use of the access road and associated infrastructure does not have unforeseen impacts on the environment and to ensure that all impacts are monitored and the necessary corrective action taken in all cases. In order to address this goal, it is necessary to operate the proposed development in a way that:

- » Ensures that operation activities are properly managed in respect of environmental aspects and impacts.
- » Enables the operation activities to be undertaken without significant disruption to other land uses in the area, in particular with regard to farming practices, traffic and road use, and effects on local residents.

OBJECTIVE 1: Limit the ecological footprint of the Access Road

Indirect impacts on vegetation and terrestrial fauna during operation could result from maintenance activities and the movement of people and vehicles on site. In order to ensure the long-term environmental integrity of the site following construction, maintenance of the areas rehabilitated post-construction must be undertaken until these areas have successfully re-established.

Project Component/s	<ul style="list-style-type: none"> » New Access Road. » Upgrade of Existing District Road DR01469 » Widening and Upgrade of Constable and Supporting Constable Farm Roads » Construction camp and laydown area Rehabilitated areas.
Potential Impact	<ul style="list-style-type: none"> » Disturbance to or loss of vegetation and/or habitat in surrounding areas. » Degradation of watercourses. » Environmental integrity of the site undermined resulting in compromised land capability and the requirement for on-going management intervention.
Activities/Risk Sources	<ul style="list-style-type: none"> » Human presence » Movement of vehicles to and from the site. » Presence of the thermal plant infrastructure and site fencing.
Mitigation: Target/Objective	<ul style="list-style-type: none"> » Maintain minimised footprints of disturbance of vegetation/habitats on-site. » Ensure and encourage plant regrowth in non-operational areas of post-construction rehabilitation.

Mitigation: Action/Control	Responsibility	Timeframe
Rehabilitate disturbed areas should the previous attempt be unsuccessful.	Operations Manager	Operation
Access to adjacent areas to be strictly controlled.	Developer	Operation
Maintain and augment natural vegetation around the proposed project.	Developer	Operation
Vegetation control should be by manual clearing and herbicides should not be used except to control alien plants in the prescribed manner.	Developer	Operation

Mitigation: Action/Control	Responsibility	Timeframe
The use of herbicides and pesticides and other related horticultural chemicals should be carefully controlled and only applied by personnel adequately certified to apply pesticides and herbicides. It must be ensured that WHO Recommended Classification of Pesticides by Hazard Class 1a (extremely hazardous) or 1b (highly hazardous) are not purchased, stored or used on site along with any other nationally or internationally similarly restricted/banned products.	Developer	Operation
Soil surfaces where no revegetation seems possible will have to be covered with gravel or small rock fragments to increase porosity of the soil surface, slow down runoff and prevent wind and water erosion.	Developer	Operation
Any vegetation clearing that needs to take place as part of the maintenance activities must be done in an environmentally friendly manner, including avoiding the use of herbicides and using manual clearing methods wherever possible.	Developer	Operation
Vehicle movements must be restricted to the designated access road.	Developer	Operation
No harvesting of plants for firewood, medicinal or any other purposes are to be permitted	Developer	Operation
No killing and poaching of any wild animal to be allowed. This should be clearly communicated to all employees, including subcontractors.	Developer	Operation
Any potentially dangerous fauna such as snakes or fauna threatened by the maintenance and operational activities must be removed to a safe location.	Developer	Operation
An on-going alien plant monitoring and eradication programme must be implemented, where necessary.	Developer	Operation
Regular monitoring of SCC present and observation regarding their extent and abundance.	EO	Operation
Appropriate management plans to (if possible) relocated or avoid disturbing SCC species, especially those which are sensitive to disturbance.	EO	Operation
Ongoing monitoring of relocated SCC must take place until it is assured that they will thrive.	EO	Operation
Annual site inspection for erosion or water flow regulation problems – with follow up remedial action where problems are identified.	Developer ECO <u>and/or</u> ESCO	Operation
No indiscriminate movement of equipment through the watercourses may be permitted during standard operational activities or maintenance activities. Use must be made of the existing watercourse crossings only.	Contractor	Operation
Routine maintenance of the Witberg access road must be undertaken to ensure that no concentration of flow and subsequent erosion occurs due to the road crossings/instream infrastructure. Such maintenance activities must specifically be undertaken after high rainfall events.	Developer	Operation

Mitigation: Action/Control	Responsibility	Timeframe
Hot spots for the build-up of debris and excess sediment must be identified and when necessary, debris/excess sediment must be removed by hand to prevent future flooding and potential damage to infrastructure.	Developer	Operation
Stormwater runoff from the road crossings should be monitored (by the Operation and Maintenance (O&M) Manager), to ensure it does not result in erosion of the watercourses. Stormwater should be allowed to diffusely spread across the landscape, by ensuring adequate surface roughness in the watercourse (through vegetation and rocky areas).	Developer	Operation
Maintenance vehicles must make use of the dedicated access road and no indiscriminate movement in the watercourses may be permitted.	Developer	Operation
During periodic maintenance activities of the access road, monitoring for erosion should be undertaken.	Developer	Operation
Should erosion be observed, caused by the road crossings/instream infrastructure, the area must be rehabilitated by infilling the erosion gully and revegetation thereof with suitable indigenous vegetation. Use can also be made of rocks collected from the surrounding area to infill any area prone to erosion, as a natural dispersal mechanism.	Developer	Operation
Monitoring for the establishment for alien and invasive vegetation species must be undertaken, specifically at the road crossings. Should alien and invasive plant species be identified, they must be removed and disposed of as per an alien and invasive species control plan and the area must be revegetated with suitable indigenous vegetation.	Developer	Operation

Performance Indicator	<ul style="list-style-type: none"> » Limited soil erosion around site. » No further disturbance to vegetation or terrestrial faunal habitats. » Continued improvement of rehabilitation efforts. » Removal to safety of entrapped/injured avifauna encountered during routine maintenance. » Low impact on nocturnal and crepuscular species along roads
Monitoring	<ul style="list-style-type: none"> » Observation of vegetation on-site by environmental manager. » Regular inspections to monitor plant regrowth/performance of rehabilitation efforts and weed infestation compared to natural/undisturbed areas.

OBJECTIVE 2: Minimise the establishment and spread of alien invasive plants

Major factors contributing to invasion by alien invader plants include high disturbance activities and negative grazing practices. Consequences of this may include:

- » Loss of indigenous vegetation;
- » Change in vegetation structure leading to change in various habitat characteristics;
- » Change in plant species composition;

- » Change in soil chemical properties;
- » Loss of sensitive habitats;
- » Loss or disturbance to individuals of rare, endangered, endemic, and/or protected species;
- » Fragmentation of sensitive habitats;
- » Change in flammability of vegetation, depending on alien species; and
- » Hydrological impacts due to increased transpiration and runoff.

Project Component/s	<ul style="list-style-type: none"> » New Access Road. » Upgrade of Existing District Road DR01469 » Widening and Upgrade of Constable and Supporting Constable Farm Roads » Construction camp and laydown area Rehabilitated areas.
Potential Impact	<ul style="list-style-type: none"> » Invasion of natural vegetation surrounding the site by declared weeds or invasive alien species. » Impacts on soil. » Impact on faunal habitats. » Degradation and loss of agricultural potential.
Activities/Risk Sources	<ul style="list-style-type: none"> » Use of access roads.
Mitigation: Target/Objective	<ul style="list-style-type: none"> » To significantly reduce the presence of weeds and eradicate alien invasive species. » To avoid the introduction of additional alien invasive plants to the site. » To avoid distribution and thickening of existing alien plants in the site. » To complement existing alien plant eradication programs in gradually causing a significant reduction of alien plant species throughout the site.

Mitigation: Action/Control	Responsibility	Timeframe
Develop and implement an Alien Invasive Control and Eradication Programme.	Developer	Operation
Avoid creating conditions in which alien plants may become established: <ul style="list-style-type: none"> » Keep disturbance of indigenous vegetation to a minimum. » Rehabilitate disturbed areas as quickly as possible. » Do not import soil from areas with alien plants. 	Developer	Operation
Annual monitoring for alien plant species with follow up clearing as needed – or as per the frequency stated in the alien invasive management plan to be developed for the site. When alien plants are detected, these must be controlled and cleared using the recommended control measures for each species to ensure that the problem is not exacerbated or does not re-occur.	EO and Plant Manager	Operation
Eradicate all weeds and alien invasive plants as far as practically possible and ensure that material from invasive plants are adequately destroyed and not further distributed.	EO and Plant Manager	Operation
Any alien and invasive vegetation removed should be taken to a registered landfill site to prevent the proliferation of alien and invasive species.	EO and Plant Manager	Operation
The use of herbicides and pesticides and other related horticultural chemicals should be carefully controlled and only applied by personnel adequately certified to apply pesticides and herbicides. It must be ensured that WHO Recommended Classification of Pesticides by Hazard Class 1a (extremely	EO and Plant Manager	Operation

Mitigation: Action/Control	Responsibility	Timeframe
hazardous) or 1b (highly hazardous) are not purchased, stored or used on site along with any other nationally or internationally similarly restricted/banned products.		
To prevent the dispersal of alien seeds maintenance vehicles and machinery must be washed regularly and away from any watercourse.	Plant Manager	Operation

Performance Indicator	» Low abundance of alien plants. For each alien species: number of plants and aerial cover of plants within the site and immediate surroundings.
Monitoring	<ul style="list-style-type: none"> » On-going monitoring of area by EO during construction. » Annual audit of development footprint and immediate surroundings by qualified botanist. » If any alien invasive species are detected then the distribution of these should be mapped (GPS co-ordinates of plants or concentrations of plants), number of individuals (whole site or per unit area), age and/or size classes of plants and aerial cover of plants. » The results should be interpreted in terms of the risk posed to sensitive habitats within and surrounding the site. » The environmental manager/site agent should be responsible for driving this process. » Reporting frequency depends on legal compliance framework.

OBJECTIVE 3: Minimise dust

Windy conditions and the movement of vehicles on site may lead to dust creation from the access road.

Project Component/s	<ul style="list-style-type: none"> » New Access Road. » Upgrade of Existing District Road DR01469 » Widening and Upgrade of Constable and Supporting Constable Farm Roads » Construction camp and laydown area Rehabilitated areas. » On-site vehicle movement.
Potential Impact	» Dust and particulates from vehicle movement to and on-site.
Activities/Risk Sources	» Wind erosion from unsealed roads and surfaces.
Mitigation: Target/Objective	» Ensure compliance with acceptable dust fall standards along access route

Mitigation: Action/Control	Responsibility	Timeframe
Implement appropriate dust suppression measures on a regular basis in any exposed surfaces.	Developer	Operation
Re-vegetation of cleared areas as soon as practically feasible.	Developer	Operation
Speed of vehicles must be restricted on site to 40km/hr.	Developer	Operation
Vehicles and equipment must be maintained in a road-worthy condition at all times.	Developer	Operation
Establish a complaints register and/or incident reporting system where personnel, communities and adjacent landowners can lodge complaints	EO and Plant Manager	Prior to commissioning

Mitigation: Action/Control	Responsibility	Timeframe
regarding construction activities. Ideal location would be security post at point of site access.		
Performance Indicator	<ul style="list-style-type: none"> » No complaints from affected residents or community regarding dust. » Dust suppression measures implemented where required. 	
Monitoring	<ul style="list-style-type: none"> » Immediate reporting by personnel of any potential or actual issues with nuisance or dust to the Plant Manager. » An incident reporting system must be used to record non-conformances to the EMPr. 	

CHAPTER 8: MANAGEMENT PROGRAMME: DECOMMISSIONING

Overall Goal: To ensure that the decommissioning of the access road associated infrastructure does not have unforeseen impacts on the environment and to ensure that all impacts are monitored and the necessary corrective action is taken at all cost.

8.1. Soil rehabilitation

The steps that should be taken during the rehabilitation of soils are as follows:

- » The topsoil used in the rehabilitation phase should not be contaminated;
- » The deposited soils must be ripped to ensure reduced compaction;
- » An acceptable seed bed should be produced by surface tillage;
- » Restore soil fertility;
- » Incorporate the immobile fertilisers in to the plant rooting zone before ripping; and
- » Apply maintenance dressing of fertilisers on an annual basis until the soil fertility cycle has been restored.

8.2. Establishment of vegetation

The objective is to restore the project site to a self-sustaining cycle, i.e. to realise the re-establishment of the natural nutrient cycle with ecological succession initiated.

The objectives for the re-vegetation of reshaped and top-soiled land are to:

- » Prevent erosion;
- » Restore the land to the agreed land capability;
- » Re-establish eco-system processes to ensure that a sustainable land use can be established without requiring fertilizer additions; and
- » Restore the biodiversity of the area as far as possible